

Analysis of U.S. Municipal Waste Combustion Operating Practices

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AN ANALYSIS OF U.S. MUNICIPAL WASTE COMBUSTION OPERATING PRACTICES

U.S. Environmental Protection Agency

Office of Solid Waste

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Abstract

This study presents the results of a nationwide survey of municipal waste combustion (MWC) facilities. The intent of the survey was to characterize the MWC industry as completely as possible. Topics covered include description of facilities, characterization of waste received, review of recycling activities, description of residue generation, and residue handling and disposal practices.

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This report is the result of a nationwide survey of municipal waste combustion facilities. The intent of the survey was to characterize the MWC industry as completely as possible. Topics covered include description of facilities (location, capacity, capacity utilized, review of recycling activities, description of residue generation, and residue handling/disposal practices).

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Note to Readers

The presentation of statistical data often leads to confusion about what the numbers actually convey. In the case of the present study, concern was expressed during the review of the draft reports about which portion of the respondent universe was actually being described for each analysis. Thus, a brief explanation is in order.

The use of percentages in the present study generally refers to "valid" percentages rather than percentages of the entire respondent universe. A "valid" response to a question is one which was both completed and intelligible. Responses to questions that do not meet both conditions were classified as missing data.

All of the statistics quoted in this report are based upon properly completed or "valid" responses. The number of valid responses varied by question. Some questions, such as "name of facility" had a very high rate of valid response, other questions, such as "amount of liquid residue generated" had very low valid response rates. Therefore, it should not be inferred that a statement such as "50 percent of the valid responses" means the same as "50 percent of the total sample." The total number of valid responses (n) is provided for each question in both the text and in Appendix D. Readers are urged to refer to the number of valid responses for those questions that are of particular interest to them.

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EXECUTIVE SUMMARY

The survey of the municipal waste combustion (MWC) industry was conducted under the authorities of Section 114 of the Clean Air Act, as amended (42 U.S.C. 7414) and Section 3007 of the Resource Conservation and Recovery Act. Following clearance from the Office of Management and Budget, EPA mailed 139 surveys to industry members in March 1988. EPA received 121 responses from the 139 facilities surveyed, or a response rate of 87 percent. This high response rate was due to members' willingness to cooperate with EPA and to provide the Agency with information about existing industry practices.

General Information

The majority of 106 valid respondents, 90 percent, use some type of mass burn combustor at their facilities. Most combustors operate 7 days per week, 24 hours per day. Over the course of a year, MWC facilities receive an average of 9355 tons of municipal solid waste per month. At a typical facility, the mix of total waste incinerated is approximately 68 percent residential, 23 percent commercial, and 9 percent industrial. Only 5 facilities indicated that they receive and burn only residential waste. Based on the responses, MWC facilities receive 8 percent more waste in the summer than in the winter.

Recycling

Approximately 50 percent of 120 valid responses indicated that some type of established municipal waste recycling program is in place. Other respondents indicated that recycling was done; however, this survey did not request information regarding private recycling programs. A majority, 66 percent, of the 65 facilities with recycling programs reported recycling more than one type of waste, including aluminum cans, bottles, newspapers and bulk or white goods, though recycling activities were not contingent upon having an established recycling program. This survey did not inquire as to whether or not batteries were recycled. Facilities with recycling programs tend to receive higher volumes of waste as compared to facilities without recycling programs.

Residue Generation

Although it is assumed that all facilities generate both bottom and fly ash, only 82 respondents indicated that they generate both bottom and fly ash, whereas 32 indicated they generate one or the other. The remaining 7 respondents did not provide information regarding ash generation. At MWC facilities,

the majority of respondents, 82 out of 105, combine bottom and fly ash, while the remaining 23 handle them separately. Only 44 percent of the valid sample (n=101) reported that they had tested liquid wastes, such as quench water, scrubber sludge, boiler cleaning waste, and other types of liquid waste.

Almost all of the survey respondents, 116, provided information about whether or not ash had ever been tested. Of these respondents, 81 percent reported that ash from their facility had been tested at some point, while 19 percent reported that it had never been tested. A total of 112 respondents indicated whether an established ash sampling and analysis program existed at their facilities. The majority, 64 percent, reported having no established ash sampling and analysis program. About 35 percent reported having a program as well as testing ash for EP toxicity. Seven percent indicated that they have an established program but do not perform the EP toxicity test (percentages add up to greater than 100% because some respondents with no sampling program responded to questions related to a sampling program). Based on the survey responses, it appears that most MWC facilities handle their ash routinely as non-hazardous.

Residue Handling and Disposal

Less than half of the 117 valid responses, 46 percent, indicated that ash was stored on site prior to disposal and 54 percent indicated no on-site ash storage. Of those respondents storing ash on site, 66 percent reported storing combined ash, 20 percent storing only bottom ash, and 7 percent storing only fly ash. The remainder stored bottom and fly ash separately.

In ash handling/storage areas, 91 of 99 valid responses indicated using runoff containment measures and 56 out of 87 valid responses reported using fugitive dust containment measures. The most widely used runoff containment measures were the sanitary sewer and collection and/or recirculation. To control fugitive dust, most respondents wetted/conditioned the ash.

Almost all respondents, 117 out of 121, revealed that ash is disposed of at a variety of disposal facilities. A municipal solid waste landfill is used by 56 percent of these respondents for ash disposal. Ash was transported to the ash disposal site by truck; no other means of transportation was cited. According to the survey responses, the mean distance that ash is transported from MWC facilities to off-site ash disposal sites is approximately 32 miles and the median distance is 8 miles. The predominant precautions taken while transporting ash include wetting the ash and covering the trucks. Only 12 out of 118 respondents indicated that ash is treated prior to disposal.

Only 51 out of 121 respondents indicated whether protective liners were used at the ash disposal facilities. Of these 51 respondents, 55 percent indicated that only clay liners were used at the disposal site and 3 percent reported that no liners were used. In responding to a subsequent question, which queried respondents about the use of leachate collection systems, 37 out of 121 respondents reported whether they used leachate collection systems at the site. These 37 respondents were not necessarily a subset of the 51 respondents who indicated whether a liner was used at the facility. A majority of the 37 respondents, 68 percent, indicated that their disposal facilities use leachate collection systems. The number of facilities with collection systems may be higher for the entire sample, however, because 21 respondents indicated that they did not know whether leachate collection systems were used at the facility. Only 10 facilities indicated that they recycle or reuse ash instead of or in addition to land disposal. Three out of the 10 facilities reported that they recycle or reuse 100 percent of the ash while the remainder responded that they recycle or reuse 20 percent of the ash.

I. INTRODUCTION

The introduction comprises the purpose, scope, and the methodology and approach to give the reader background on the survey before the discussion on the analyses of responses.

1. PURPOSE

During 1987-88, the Environmental Protection Agency (EPA) has focused attention on municipal waste combustor (MWC) emissions and ash generation. EPA completed a preliminary assessment of MWC emissions and concluded that these emissions may contribute to the endangerment of human health and the environment. As a result, EPA intends to establish additional regulations to control the emissions from new and existing MWCs. EPA has also initiated the development of a comprehensive program plan for MWC ash management. To complete these activities, data collection and analysis of the existing MWC waste management practices are required.

The purpose of this study is to collect and analyze information on the municipal waste combustion (MWC) industry for the Office of Solid Waste (OSW) within the Office of Solid Waste and Emergency Response (OSWER) and the Office of Air Quality Planning and Standards (OAQPS) within the Office of Air and Radiation (OAR). The data and supporting analyses will provide useful information on ash handling processes to assist EPA in developing an ash management strategy and/or ash management regulations.

The information received is both industry-wide and facility-specific. Future analyses based on this information are intended to make any potential ash management strategy or regulations more comprehensive and cost-effective by taking into account the industry's present ash management status and obvious operating constraints.

ORD/Las Vegas Environmental Monitoring Systems Laboratory (EMSL) conducted a follow-up survey of landfill operators who received MWC ash from facilities identified in this survey (EPA/ORD, "Characterization of Municipal Waste Combustion Ash Disposal Practices and Facilities," EPA/600/x-88/360, Oct. 1988). The findings differed in several specific areas. The most notable differences focused on the use of liners and leachate collection systems at ash disposal facilities and likely stem from the fact that EMSL's survey respondents were operators of municipal waste disposal facilities while the respondents to the present study were operators of municipal waste incinerators. The EMSL study used the data base of MWC facilities compiled for the present study as a starting point.

2. SCOPE

This study was conducted under the authorities of the Clean Air Act (CAA) and the Resource Conservation and Recovery Act (RCRA) over a 6-month period during which 139 surveys of 150 questions per survey were mailed to MWC facilities in the United States (Appendix A provides a copy of the information request letter and a list of addressees while Appendix B provides a list of all responding MWC facilities). The survey questionnaire consisted of the following nine sections:

- I. General Facility Information
- II. Municipal Waste Characterization
- III. Combustor Design and Operation
- IV. Air Pollution Control Devices
- V. Air Emissions Data
- VI. Residue Generation
- VII. Solid Residue Generation
- VIII. Cost and Economic Information
- IX. Suggestions for Future Questionnaires.

This report is concerned only with the solid waste portions of the questionnaire (Sections I, II, VI, and VII) and is intended to be a discrete task. However, the resulting analyses may be used in subsequent ash-related studies or data collection efforts. OSW's effort was conducted independent of OAQPS.

3. METHODOLOGY AND APPROACH

This section contains information on data preparation, design of the data base, quality assurance measures, and the methodology used to analyze the data received by the respondents.

A. Data Preparation

OAQPS mailed 139 survey questionnaires in March 1988 following Office of Management and Budget (OMB) clearance (a sample questionnaire is included as Appendix C). Respondents were given 45 business days to complete and return the questionnaires to OAQPS. Responses were then photocopied, confidential business information was stored in locked files in accordance with standard procedures to prevent the unauthorized disclosure of all confidential business information, and the responses were distributed to OSW. OAQPS retained the confidential portions of the surveys and forwarded them to OSW at a later date.

As surveys were received by OSW, they were individually logged in on a LOTUS 1-2-3 data base containing the following information:

- MWC facility name and location
- MWC facility contact and phone number
- Ash disposal site and location
- Ash disposal site contact and phone number.

A copy of the output from this data base is included as Appendix B.

OAQPS and OSW followed-up on responses that were either not received by the specified deadline or were incomplete or ambiguous. OAQPS contacted non-respondents by telephone and/or mail and established new deadlines.

The final working data base used for the analyses in this report contains 121 completed responses. Of the total responses, 60 provided data on the amount of time it took to complete the survey questionnaire. Total time varied from 1.5 to 215 hours with a sample mean of 30.9 hours, and a median of 20 hours.

The quality of responses also varied considerably. Those respondents who devoted very little time to the questionnaire generally provided incomplete responses. The statistics quoted in this report are therefore based on the number of valid responses from among all responses received.

The term "valid" refers to responses that have been properly completed. Thus, cases in which a respondent obviously did not interpret a question correctly and provided an erroneous response would not be considered valid even though an attempt was made to answer the question. The number of valid responses is indicated for each analysis (i.e., using $n=$ ___). Appendix D contains the number of valid responses and the corresponding response rates for each survey question.

B. Data Base Design

The survey responses were entered onto an SPSS/PC+ data base as they were received. SPSS/PC+ was selected for the following reasons:

- Sufficient data storage space
- User friendliness
- Complete array of statistical capabilities
- Compatibility with OAQPS's software
- Availability in-house.

The complete MWC survey data base contains 200 individual variables times 121 records where each survey represents one record. A copy of the data base coding structure is attached as Appendix E.

Open-ended questions were grouped according to common elements in order to create a finite number of coded categories. Inconsistent or incomplete responses were subject to interpretation by OSW.

C. Quality Assurance

The following techniques were used to ensure data accuracy and reliability:

- A sample of the data base was tested by generating statistical analyses to ensure coding reliability and consistency;
- A listing of all information input into the data base was checked against the original survey questionnaires to verify correct data entry
- All final calculations contained in exhibits based on primary statistical data were recalculated to verify accuracy.

D. Analytical Methodology

The analyses of the survey data rely primarily on summary statistics of ratio-level (e.g., tons of waste received per month) and categorical (e.g., type of waste recycled) variables across the survey sample. Means, medians, ranges, and sample proportions are the primary statistical measures used to characterize the responses.

The reliability of the statistics generated varies by survey question. Certain questions were posed in an ambiguous manner on the questionnaire and therefore responses to these questions were not consistent across the sample. Potential data ambiguities of this sort are noted in the analysis section which follows. The number of valid responses to each question are also indicated for each exhibit. The terms "sample," "respondent," and "facility" used throughout the report generally refer to valid responses (i.e., not including missing or ambiguous data).

Because of the large response rate relative to the population (87% of all MWC facilities) data reliability for unambiguous questions is very high. The objective in performing statistical analyses is to accurately characterize a given population using a sample that approximates the population as closely as possible. For very large populations, random samples are generated to be able to generalize from the sample to the population. For the purposes of this report, the sample size approaches the entire population thereby minimizing the potential for sampling error although some selection bias may have occurred if some nonrandom characteristic was associated with facilities that chose not to respond.

II. ANALYSIS OF SURVEY RESPONSES

This section provides a detailed discussion of the MWC facility survey response summary statistics. The reliability of the data is generally high though, as mentioned previously, the wording of certain questions may have lead to some confusion among the respondents. Additionally, several open-ended questions required interpretation on the part of OSW.

Missing values present another source of potential data misinterpretation. The statistics derived from the survey responses therefore generally exclude missing values and are based only on the number of valid responses. Other areas of data ambiguity are outlined where relevant.

The analysis of survey responses which follows is divided into the following five sections:

- Description of Facilities
- Waste Characterization
- Recycling Activities
- Residue Generation
- Residue Handling and Disposal.

It should be noted that several of the questions resulted in a listing of more than one discrete category. The categorical percentages calculated from these data, therefore, do not sum to 100 percent.

1. DESCRIPTION OF FACILITIES

In total, 121 responses from 37 States (including the District of Columbia) were received and input into an SPSS data base. A map showing the number of respondents by State is shown in Exhibit II-1. The total universe of MWC facilities that received the MWC survey is mapped by State in Exhibit II-2.

The percentage of the sample with one or more combustor units by unit type is as follows:

EXHIBIT II-1
Total Municipal Waste Combustor Survey
Respondents, by State

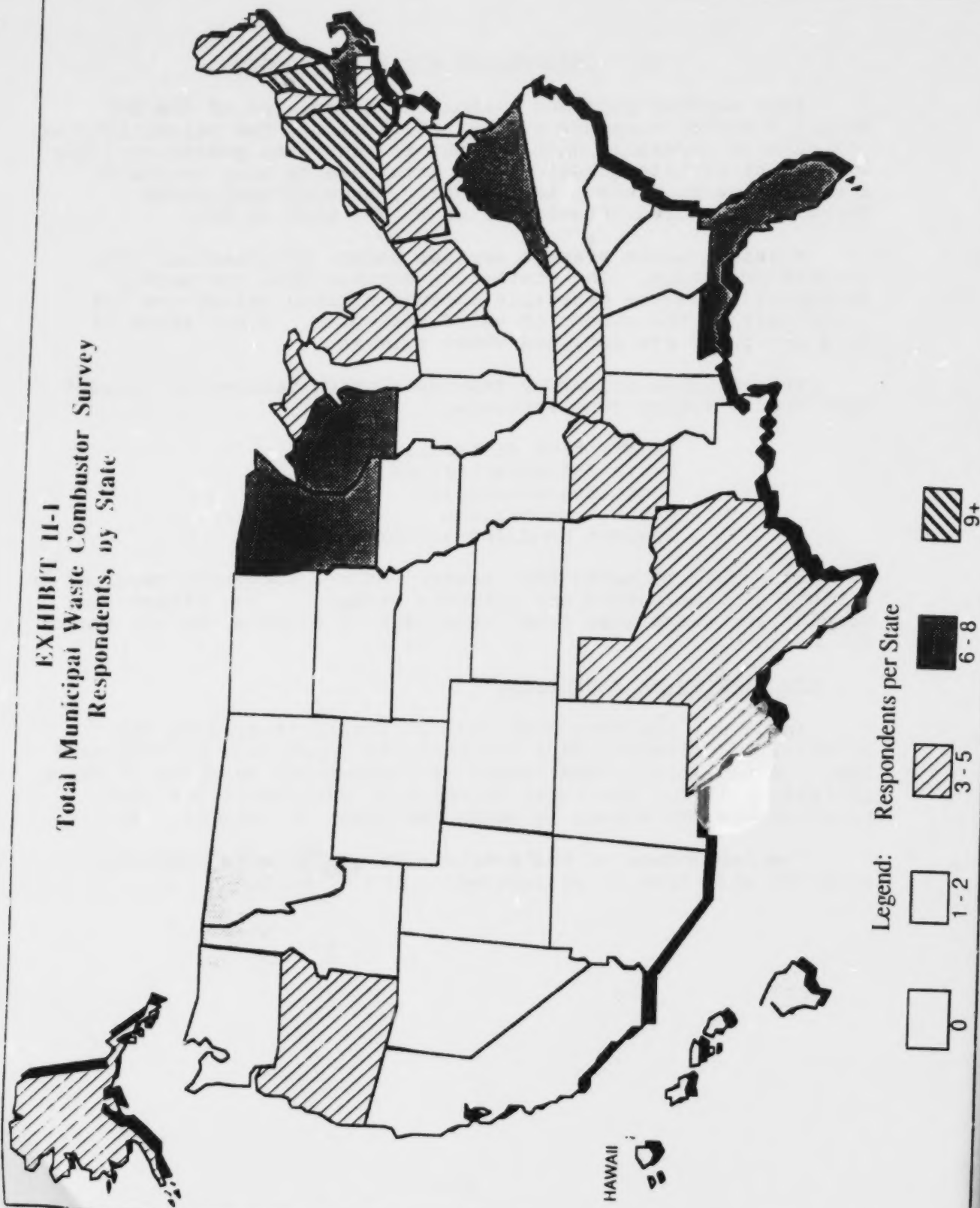


EXHIBIT II-2
Total Municipal Waste Combustor
Facilities, by State *

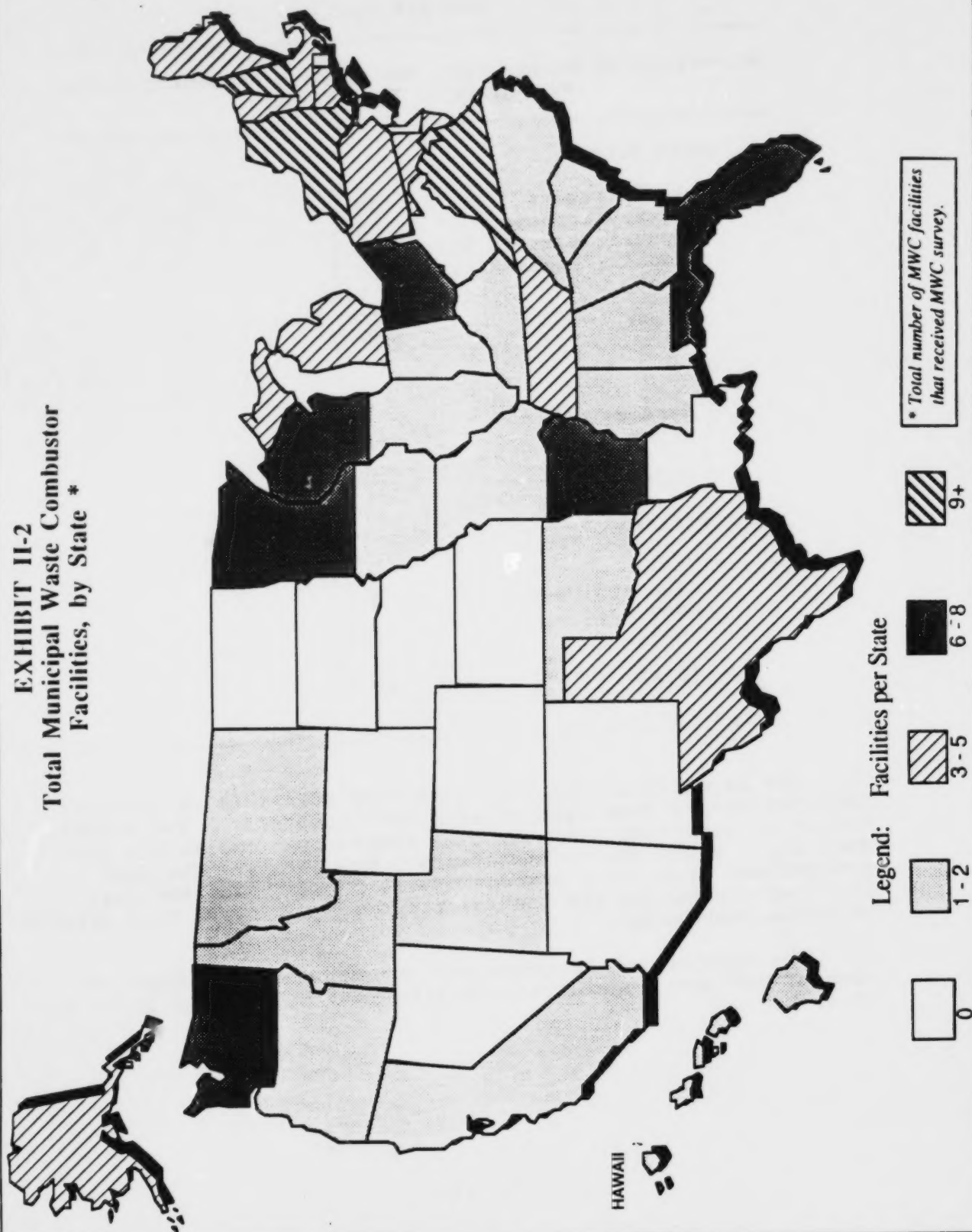


EXHIBIT II-3

Percentage of Sample With One or More Combustor Units,
by Combustor Type (n=119)

Mass Burn

- Field Erected	39.5%
- Rotary Combustor	5.0
- Modular Starved Air	26.1
- Modular Excess Air	10.9
- Other	8.4

- TOTAL	89.9

RDF

- Spreader Stoker	8.3%
- Other	5.0

- TOTAL	13.3

Co-Fired

- Coal	3.2%
- Sewage Sludge	5.0
- Wood Chips	3.3
- Other	7.5

- TOTAL	19.0

The majority of the 119 valid respondents (89.9 percent) reported having some type of mass burn combustor. The actual number of combustor units by type ranged from one to six per facility. Field erected mass burn combustors are the most predominant type (39.5 percent of valid responses) and coal co-fired combustors are the least predominant types (3.2 percent of valid responses).

The mean number of hours per day and number of days per week of combustor operation are displayed in Exhibits II-4a and II-4b.

EXHIBIT II-4a
Combustor Operating Schedules (1987)
Hours Per Day

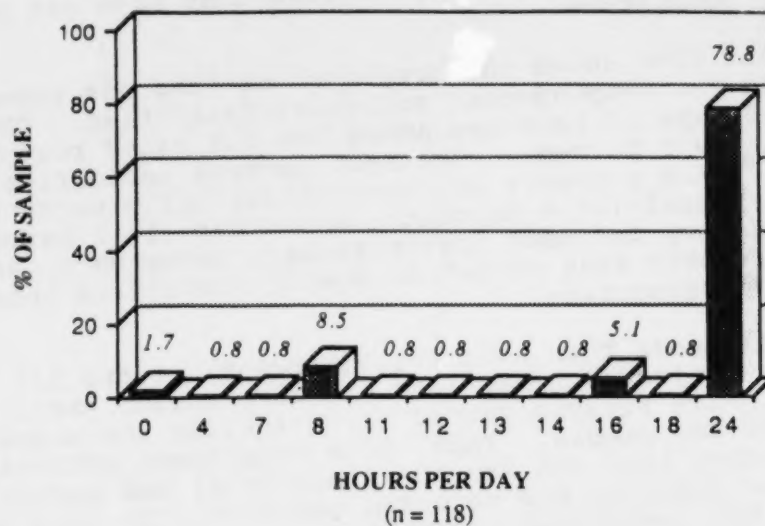
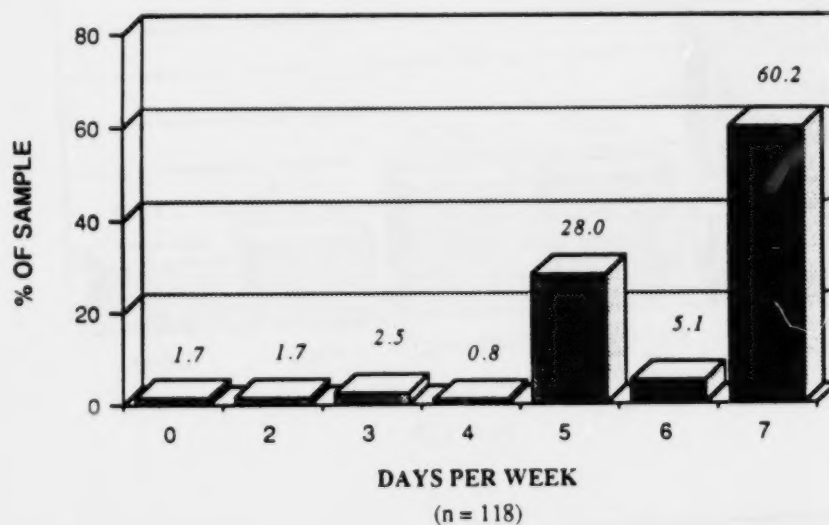


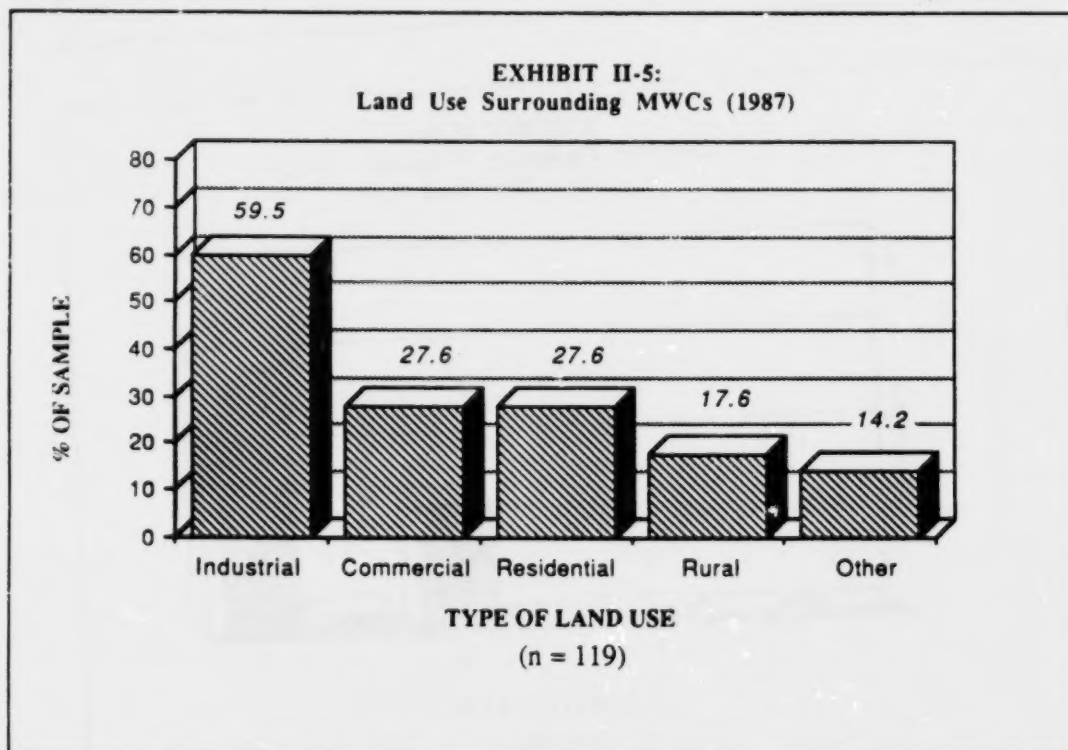
EXHIBIT II-4b
Combustor Operating Schedules (1987)
Days Per Week



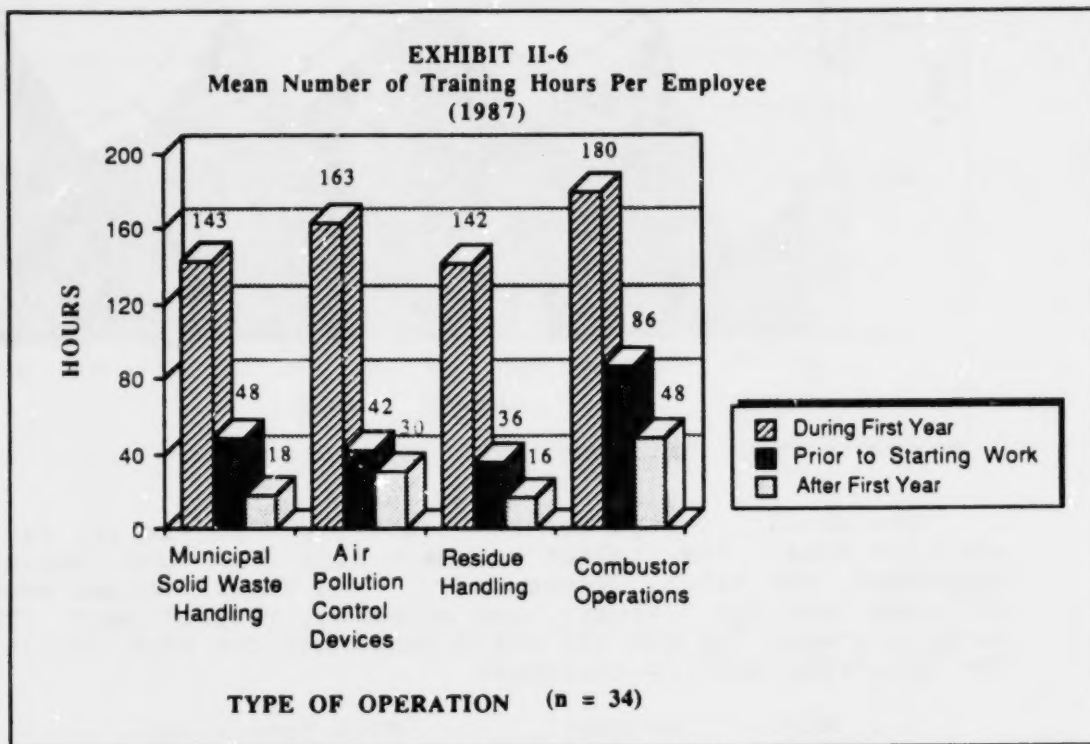
Of the 118 valid responses, most respondents (78.8 percent) operate their combustors 24 hours per day. A majority (60.2 percent) also operate combustors 7 days per week and a significant proportion (28.0 percent) operate their combustors only 5 days per week. The 2 respondents that indicated zero hours of operation refer to facilities that have not yet begun to fire their combustors.

Exhibit II-5 shows the breakdown of land use types surrounding the respondents' combustor facilities. The predominant type of land use among the 119 valid responses is industrial (59.5 percent). The next largest categories are commercial (27.6 percent) and residential (27.6 percent), followed by rural (17.6 percent), and other (14.2 percent). The "other" category includes institutional, government, and other types of property that cannot be easily classified into one of the standard categories.

Slightly more than half (51.8 percent) of the 119 valid respondents indicated mixed land use surrounding their facilities. The figures quoted above include the mixed use component of the sample. Thus, if a respondent indicated that the surrounding land use was both industrial and commercial for example, the response was recorded separately in each category. Therefore, the individual percentages do not sum to 100.



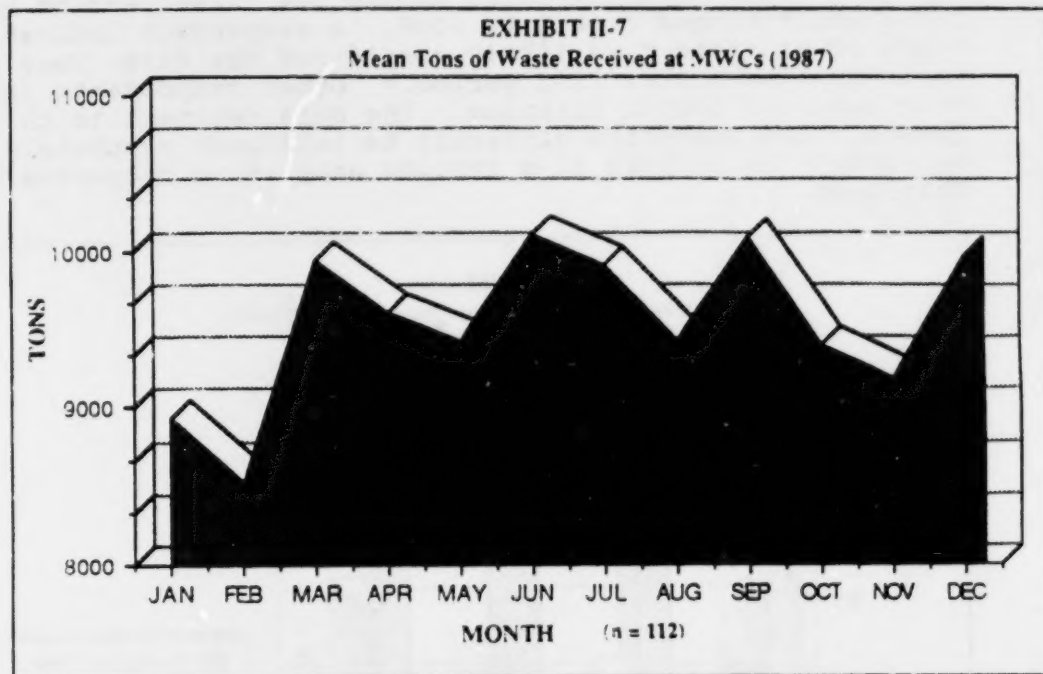
Operator training is required by a local or State agency for 28.6 percent of the 119 valid respondents. The mean number of training hours by type of training and timing of training are shown in Exhibit II-6. The question soliciting this information in the survey did not clearly define the term "training." Respondents therefore interpreted training to mean different things. Total training hours during the first year of employment for example ranged from 0 to 2000. A respondent indicating 2000 hours of training time likely considered the first year of employment as a "training period." Other respondents indicated only hours of formal training. The data relevant to this question are therefore difficult to interpret accurately. The bar graphs in Exhibit II-6 include only valid responses greater than zero.



Based on the responses, the greatest emphasis on training is during the first year of employment, with very little follow-up training. Employees have had the most training in combustor operation during the period prior to starting work. The greatest number of training hours are devoted to this area during the first year of employment as well. The fewest number of training hours are devoted to residue handling which on average receives 38 hours less than combustor operation during the first year of employment.

2. WASTE CHARACTERIZATION

Exhibit II-7 shows the mean monthly volume of municipal solid waste (MSW) received by facilities in the survey sample. This question had a high response rate and was unambiguously posed. The data therefore are very reliable.



The annual average monthly waste input across all facilities was 9355 tons. The highest volume months were June, December, September, and March, respectively. The lowest volume months included February, January, and November, respectively. Three month averages for the 112 valid responses for each season yield the following monthly averages:

• Winter (Jan-Mar)	8910 tons/month
• Spring (Apr-Jun)	9491 tons/month
• Summer (Jul-Sep)	9617 tons/month
• Autumn (Oct-Dec)	9400 tons/month

These numbers indicate a slight seasonal trend in MWC waste receipts. Facilities tend to receive approximately 8 percent more waste on average during the summer as compared to the winter.

The breakdown of the types of waste combusted at an average facility based on approximately 92 valid responses is as follows:

• Residential	68.3%
• Commercial	23.1%
• Industrial	8.6%
• Other	1.2%

Thus, at a typical facility, the mix of total waste combusted is primarily residential with industrial wastes contributing less than 9 percent. While residential waste appears to constitute the largest component of combustible waste, only 5 respondents indicated receiving and burning solely residential waste.

Exhibit II-8 shows additional processing that occurs before the waste is burned. The data in this exhibit indicate that bulky/oversize combustibles and noncombustibles are removed by the greatest proportion of facilities in the valid sample.

EXHIBIT II-8

Additional Waste Processing

% of Sample Removing <u>Combustibles</u> (n=113)		% of Sample Removing <u>Noncombustibles</u> (n=118)		% of Sample With Additional <u>Processing</u> (n=110)	
Paper/Cardboard	6.2%	Glass	21.0%	Shredding	15.5%
Bulky/Oversize	56.1	Bulky/Oversize	74.4	Baling	3.6
Plastic	3.6	Batteries	46.3	Pelletizing	0.0
Other	19.5	Metals	51.4	Other	17.3
None	38.9	Other	16.0	None	71.8
		None	13.6		

Batteries and metals are removed by a significant proportion of the 118 validly responding facilities while plastic and paper/cardboard are removed by relatively few. Noncombustibles are removed by 86.4 percent of the validly responding sample facilities compared to 61.1 percent for combustibles. The survey questionnaire did not address the specific means by which these wastes are removed.

The following waste characteristics were also derived from the survey results:

- For 101 valid responses, a mean of 8.7 percent and a median of 2.0 percent of a facility's waste is disposed of by means other than combustion (other means of disposal were not specified).
- The mean waste storage capacity for 109 valid responses is 1349 tons with a range of 4 to 8000 tons and a median of 450 tons.
- Separate piles of wet and dry garbage are maintained by 11.8 percent of the valid response sample (n=119).
- Refuse derived fuel (RDF) is fired by 13.3 percent of the 120 validly responding sample facilities.
- A mean of 33 percent (n=11) by weight of the total municipal solid waste collected, 37 percent (n=6) of the heat content, and 16 percent (n=13) of the ash content is removed during RDF processing for those facilities that fire RDF fuel.
- The mean heating value of the as-fired RDF is 5437 Btu/lb with a median of 5385 Btu/lb (n=14).
- Approximately 30 percent of the 117 valid responses reported co-firing MSW with another fuel and 51 percent of this subgroup add co-fired fuel through a separate feed system.

3. RECYCLING ACTIVITIES

Approximately 50 percent of the 120 valid responses indicated having a municipal recycling program. Some respondents indicated that they did not have a municipal recycling program but indicated in the subsequent question that some recycling was done. This likely resulted because the questionnaire did not address private recycling programs.

The percent of the sample recycling for each type of waste is shown in Exhibit II-9.

EXHIBIT II-9

Percentage of Sample By Waste Recycled

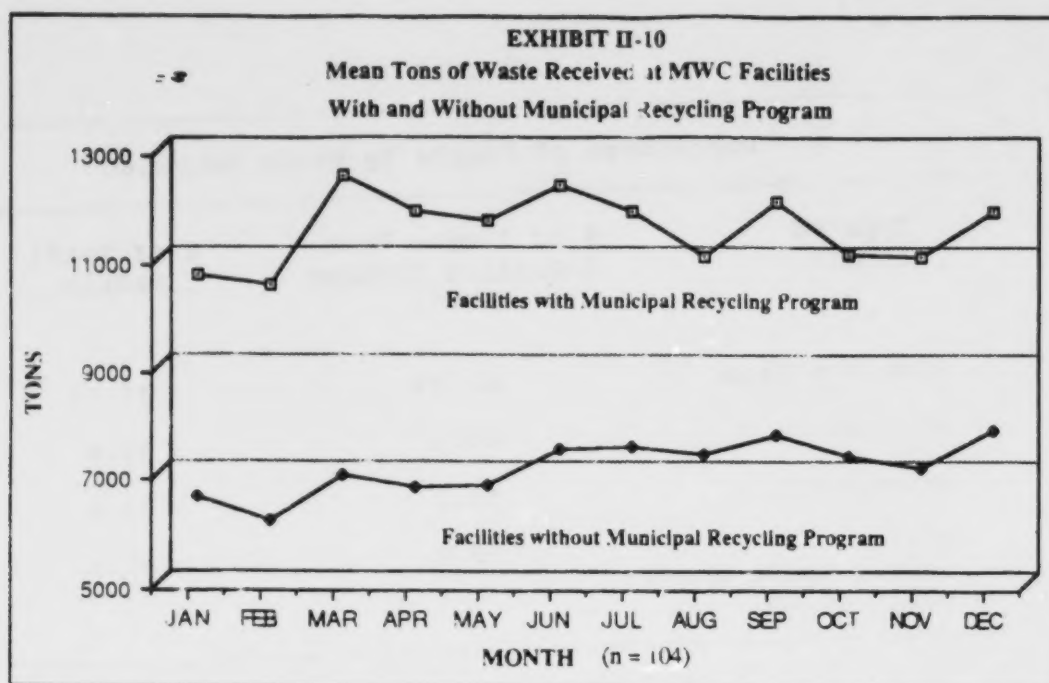
<u>Type of Waste</u>	<u>% of Sample With Recycling Program</u> (n=65)	<u>% of Total Sample</u>
Aluminum Cans	67.6%	36.3%
Bottles	63.1	33.9
Newspapers	58.3	31.4
Other (e.g., white goods, bulk goods)	59.9	32.3

The percentages do not sum to 100 because 66 percent of the 65 facilities that recycle reported recycling more than one type of waste. A significant number of these (32.3 percent) indicated recycling all four types of waste. Only three facilities reported recycling only newspapers. The survey questionnaire did not inquire about recycling of batteries.

On average, about 30 percent of a facility's residential waste is collected in the area with the recycling program. The mean proportion of discards recycled by each facility with a recycling program is shown below:

	<u>Mean Proportion Discards Recycled</u>
• Aluminum Cans (n=16)	28.7%
• Bottles (n=12)	36.1%
• Newspapers (n=12)	10.0%
• Other (n=17)	15.3%

Exhibit II-10 shows mean tons of waste received by facilities with and without recycling programs. The data indicate that MWC facilities with recycling programs tend to have significantly higher volumes of waste received as compared to MWC facilities without recycling programs.



4. RESIDUE GENERATION

The proportion of the sample indicating type of solid residue streams generated by facilities is shown below:

	Percent of Sample (n=114)
• Bottom Ash	93.0%
• Fly Ash	83.4
• Acid Gas Control Sorbent	6.1
• Other	6.2

The majority of the 114 valid respondents (71.9 percent) reported generating both bottom and fly ash. The remaining 28.1 percent reported generating only one or the other. Bottom ash and fly ash are handled separately by 21.9 percent of the total valid respondents and combined by 78.1 percent of the total valid respondents.

Approximately 44 percent of the valid sample (n=101) reported ever having tested their liquid wastes. The mean liquid residue generation for all valid responses greater than zero is as follows:

Mean Annual Volume

• Quench Water (n=35)	36,431,914 gals
• Scrubber Sludge (n=29)	26,931 gals
• Boiler Cleaning Waste (n=29)	14,931 gals
• Other (n=19)	755,263 gals

Exhibits II-11a and II-11b summarize the responses pertaining to ash testing. Approximately 81 percent of the valid sample (n=116) indicated that ash from their facility has been tested at some point while 19 percent indicated that it had never been tested. A total of 112 respondents indicated whether an established ash sampling and analysis program existed at their facilities. The majority, 64.3 percent, reported having no established program. About 35 percent reported having an established program as well as testing for EP Toxicity while 7.3 percent reported having a program but not testing ash for EP toxicity. It must be noted that some respondents proceeded to answer questions regarding an ash sampling program, even though they had responded negatively to having an established program. Therefore, the percentages add up to greater than 100 percent.

Less than 15 percent of all respondents returned ash testing data with their submittals. There was little consistency in the sampling procedures (i.e., fly ash and bottom ash was combined by some facilities and tested separately by others) or test method employed.

Few facilities tested fly ash separately. Consequently, it is difficult to ascertain the extent to which fly ash would exceed the regulatory threshold under the EP toxicity test. Many facilities tested only for lead and cadmium while others submitted toxic trace metal weight percent information which fails to consider the potential leachability of these metals. Based on the survey responses, it appears that most MWC facilities handle their ash routinely as non-hazardous.

Approximately 14 percent of all responses indicated having a written sampling quality assurance plan, 27 percent indicated they had no quality assurance plan, and over 60 percent did not know or failed to respond to the question. From the entire sample, 30.9 percent of the respondents indicated conducting analytical tests on a regular basis.

The questions pertaining to the details of analytical testing were reliably completed by a very small fraction of the sample (generally 1 to 5 valid responses), therefore these statistics are not included in this report.

EXHIBIT II-11a

Percentage of MWC Facilities That Have Had
Ash Samples Analyzed

(n = 116)

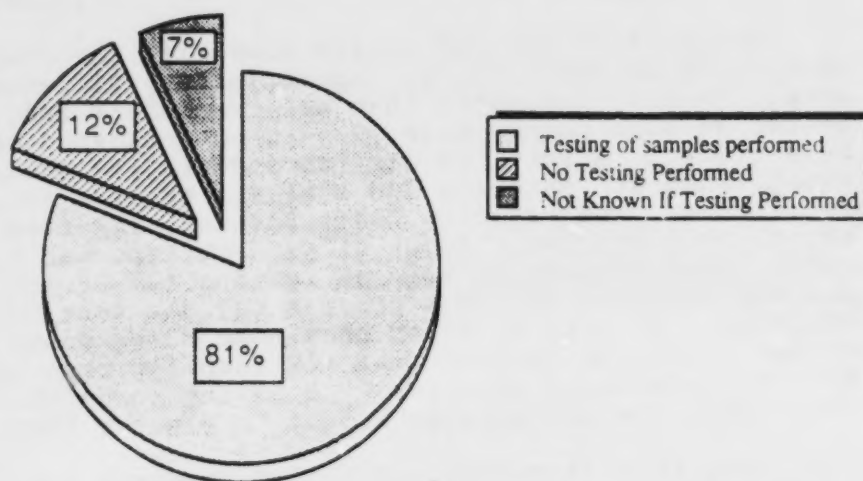
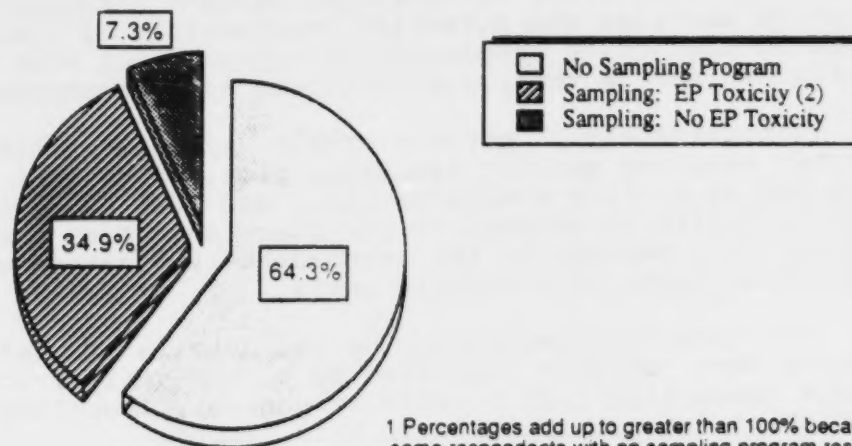


EXHIBIT II-11b

Percentage of Respondents With an Established Ash Testing Program,
and Percentage That Indicated That They Subject Their
Ash Samples to EP Toxicity Procedures (1)

(n = 112)



1 Percentages add up to greater than 100% because some respondents with no sampling program responded to questions regarding a program.

2 May include additional testing procedures.

The following sample percentage breakdown shows what responding facilities eventually do with the residue sampling and analysis data they collect:

	Percent of Sample (n=103)
• Submitted to State Agency	46.6%
• Submitted to Federal Agency	2.9
• Submitted to State & Federal Agency	4.9
• Internal Use Only	17.5
• Published	2.9
• Other	9.7

5. RESIDUE HANDLING AND DISPOSAL

On-site storage of ash prior to disposal was reported by 46.2 percent of 117 valid responses; 53.8 percent of the 117 respondents indicated no on-site storage of ash. Of those respondents who store ash on-site, 66 percent reported storing combined ash, 7 percent storing only fly ash, 20 percent storing only bottom ash, and the remaining 7 percent store both bottom and fly ash separately. In the previous section, 21.9 percent of 105 valid respondents indicated handling fly and bottom ash separately. This discrepancy may be due to the difference between simply "handling" ash, and "storing" ash.

The average capacity of the storage area as reported by 20 respondents is 876 tons. The average quantity of ash stored as reported by 24 respondents is 380 tons.

The list below shows what fractions of the sample use which types of containment measures in the ash handling/storage areas:

<u>Runoff Containment</u>	Percent of Sample (n=99)
- Sanitary Sewer	15.2%
- Drainage and/or Recirculation	20.2
- Sanitary Sewer and Drainage	2.0
- Ash in Pit - Gravity Settling	8.1
- Drainage and Gravity Settling	3.0
- Wastewater Treatment System	9.1
- Storage Tank Area	12.1
- None	9.1
- Other	8.1
- Unknown	13.1

<u>Fugitive Dust Containment</u>	<u>Percent of Sample (n=87)</u>
- Ash Wetted/Conditioned	39.1%
- Covered/Wetted Conveyors	12.6
- Ash Recirculated/Captured	2.3
- None	23.0
- Other	5.7
- Unknown	17.2

Ash was reported to be transported by truck to the disposal site by 100 percent of the 116 valid responses. No other means of transportation was cited. On average, the ash disposal site is approximately 32 miles from the off-site disposal facility with a median of 8 miles. Distances ranged from zero to 700 miles.

Ash is disposed of in a variety of disposal facilities. The list below provides a breakdown of these:

<u>Ash Disposal Site Type</u>	<u>Percent of Sample (n=117)</u>
• Municipal Solid Waste Landfill	55.6%
• Industrial Solid Waste Landfill	2.6
• On-Site Ash Monofill	12.8
• Off-Site Ash Monofill	17.1
• On-Site Surface Impoundment	0.9
• On-Site Stockpiles	0.9
• Other	10.2

The following precautions were reported to be taken while transporting ash to the disposal facility:

<u>Precautions</u>	<u>Percent of Sample (n=114)</u>
• Ash Wetted	28.1%
• Truck Covered	37.7
• Ash Wetted and Truck Covered	25.4
• Other	0.9
• None	6.1
• Unknown	1.8

Of 118 valid responses, 10.2 percent indicated that the ash is treated prior to its disposal. Two respondents (1.9 percent) cited that they neutralize the ash prior to disposal and another two respondents indicated that they stabilize ash prior to disposal.

The respondents indicated that on average, ash has been sent to the disposal site mentioned for nearly 6.4 years. One respondent reported sending ash to the same disposal site for 50 years.

Other wastes disposed of at the disposal site used by respondents are as follows:

<u>Waste Type</u>	<u>Percent of Sample (n=79)</u>
• Non-Combustibles	11.4%
• Solid Waste	22.8
• Industrial Solid Waste	3.8
• Municipal Solid Waste	39.2
• Demolition Waste	3.8
• None	13.9
• Unknown	5.1

Approximately 43 percent of the 77 valid respondents to the question indicated that ash is placed in a segregated portion of the disposal site. Another 46 percent indicated that ash is mixed with other trash at the disposal site.

The use of protective liners (both off-site and on-site) by the disposal facilities discussed by the respondents was cited by 96.1 percent of the 51 valid responses. Of these, more than half (54.9 percent) indicated clay liners. [The ORD/EMSL survey reported that 40 percent of the 72 facilities they surveyed were not lined.] Exhibit II-12 (on the following page) shows the breakdown of valid responses by liner type for this survey. In responding to a subsequent question, which queried respondents about the use of leachate collection systems, 37 out of 121 respondents reported whether they used leachate collection systems at the site. A majority of the 37 respondents, 68 percent, indicated that their disposal facilities use leachate collection systems. The number of facilities with collection systems may be higher for the entire sample, however, because 21 respondents indicated that they did not know whether leachate collection systems were used at the facility. [The ORD/EMSL survey reported that 50 percent of the 72 facilities surveyed have a leachate collection system.] Run-on/run-off controls at disposal sites were indicated by 94.7 percent of the valid responses.

A total of ten facilities reported doing any recycling or reuse of ash in lieu of or in addition to land disposal. Of this group, three noted that they recycle or reuse 100 percent of the ash. The remaining seven facilities responded that they recycle or reuse 20 percent or less. The following table summarizes the frequency of response by percentage ash recycled:

Percent Ash Recycled

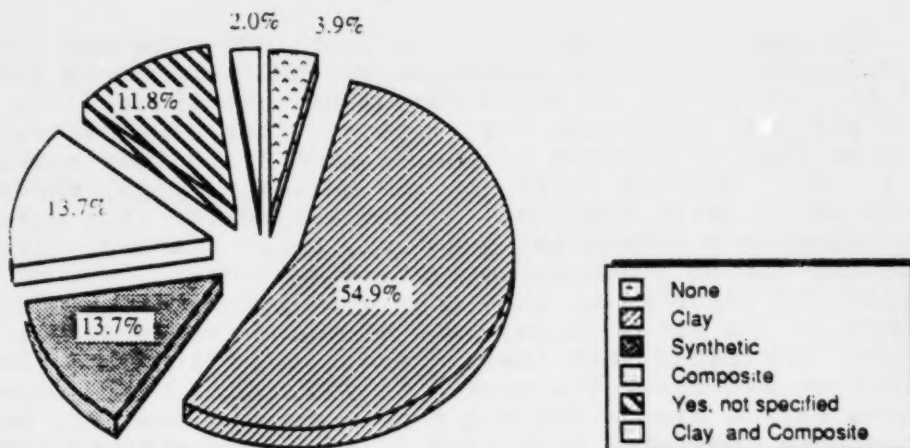
Number of Respondents

1.0	3
4.0	1
10.0	1
20.0	2
100.0	3
0.0	95

Of the ten facilities that reported recycling ash, two use it only as aggregate, one uses it for both aggregate and landfill cover, one for aggregate and concrete blocks, one for concrete blocks only, one for metal reclamation, two for aggregate and metal reclamation, and one did not specify.

EXHIBIT II-12

Type of Liner Employed for MWC
Ash Disposal (1987) (n = 51)



A-1

APPENDIX A

INFORMATION REQUEST LETTER

AND

LIST OF ADDRESSEES



A-3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park North Carolina 27711

March 7, 1988

Mr. Larry Harmon
City Engineer
Sitka Municipal Incinerator
304 Lake Street
Sitka, Alaska 99835

Dear Mr. Harmon:

As you may know, the U. S. Environmental Protection Agency (EPA) has completed a preliminary assessment of air emissions from municipal waste combustors (MWC's). Based on this assessment, EPA has concluded that MWC emissions may reasonably be anticipated to contribute to the endangerment of public health and welfare. As a result, EPA intends to establish additional regulations for the control of air emissions from new and existing MWC facilities. For your information, a copy of the Federal Register notice which describes the results of the preliminary assessment and announces the EPA's intent to propose regulations for MWC emissions is enclosed (Enclosure 1). Concurrent with the development of emission regulations, EPA has also initiated an effort to develop a comprehensive MWC ash (residue) management strategy. Extensive data collection and analysis will be required for both EPA activities for the existing population of MWC's. As a result, EPA is currently gathering needed information from each facility in the existing MWC population.

Air emissions from new or modified MWC's currently are regulated under the new source performance standards (NSPS) for incinerators (40 CFR 60 Subpart E) and large industrial boilers (40 CFR 60 Subpart Db) under Section 111(b) of the Clean Air Act (CAA). Both regulations limit only the emission of particulate matter and do not apply to existing facilities. The existing NSPS will be revised to regulate other criteria pollutants (possibly carbon monoxide and sulfur dioxide) in addition to particulate matter, and one or more designated pollutants such as dioxins/furans and hydrogen chloride. The regulation of a designated pollutant will invoke Section 111(d) for the issuance by EPA of existing source guidelines to be used by States in developing emission standards for the designated pollutant from existing MWC's. In both the development of the revised NSPS and the existing source emission guidelines for air emissions, and the development of a comprehensive management strategy for MWC ash, EPA intends to consider the full range of potential impacts of regulation. For existing sources, retrofit feasibility, costs, and compliance times will be of particular concern. Detailed information is needed on (a) individual combustor design and operating parameters, (b) type, quantity, and character of emissions and

residues generated, (c) air pollution control system design and operating parameters applied at individual MWC's, (d) performance of combustors and air pollution control systems, (e) disposal of solid and liquid residues, and (f) revenues and financing.

This letter requests that the owner/operator of the Sitka Municipal Incinerator provide the information itemized in Enclosure 2. The information provided by you and other MWC's is critical to the development of equitable regulations and guidelines. The responses will be used in studies of control feasibility, emission reductions, costs, and environmental and economic impacts. We are sensitive to the labor required to respond to this request and have tried to limit its scope to only information that is absolutely necessary. A copy of this Information Request is being sent to the State agency responsible for air pollution control for your facility and also to the appropriate EPA regional office.

The authority for the EPA's information gathering is included in Section 114 of the CAA, as amended (42 U.S.C. 7414) and under Section 3007 of the Resource Conservation and Recovery Act. Enclosure 3 contains a summary of this authority. If you believe that disclosure of specific pieces of information you submit would reveal a trade secret, you should clearly identify such pieces of information. Please do not label an entire response "confidential" if only certain portions consist of trade secret information. It will expedite the study and simplify problems if you would separate any data claimed to be confidential from the balance of the data. Please refer to Enclosure 3 for the information EPA may require, at a later time, to support your confidentiality claims. Any information subsequently determined to constitute a trade secret will be protected under 18 U.S.C. 1905. If no claim of confidentiality accompanies the information when it is received by EPA, it may be made available to the public by EPA without further notice (40 CFR Part 2.203, September 1, 1986). All emission data, however, will be available to the public.

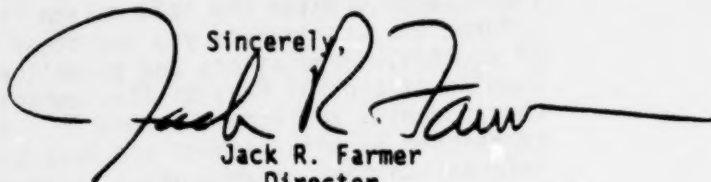
The EPA has contracted Radian Corporation (Radian) (Contract Number 68-02-4378) and Energy and Environmental Research Corporation (EERC) (Contract Number 68-03-3365) to assist EPA in developing the technical basis for any ensuing regulations. Thus, as noted in Enclosures 4a and 4b, Radian and EERC have been designated by EPA as authorized representatives of the Agency. Therefore, they have the rights discussed above and in Enclosure 3. As designated representatives of the Agency, Radian and EERC are subject to the provisions of 42 U.S.C. 7414(c), respecting confidentiality of methods or processes entitled to protection as trade secrets.

Enclosure 5 summarizes Agency and Emission Standards Division policies and procedures for handling privileged information and describes the EPA contractor commitments and procedures for use of confidential materials. It is the EPA's policy that compliance by an authorized representative with the requirements detailed in Enclosure 5 provides sufficient protection for the rights of submitters of privileged information.

A 3

If you have any general questions regarding this request or specific questions regarding Sections I, III, IV, V, VIII, or IX, or are unable to provide responses to the enclosed questions by May 6, 1988, please contact Mr. Ron Myers or Mr. Mike Johnston at (919) 541-5407. If you have specific questions regarding Sections II, VI, or VII, please contact Ms. Gerry Dorian at (202) 475-7700.

Sincerely,

A handwritten signature in dark ink, appearing to read "Jack R. Farmer", with a long horizontal flourish extending to the right.

Jack R. Farmer
Director
Emission Standards Division

5 Enclosures

cc: Michael Schultz, EPA Region X Office
Stan Hungerford, Alaska Department of
Environmental Conservation, Juneau, Alaska

Identical letters were sent to the following addressees with changes as noted:

Mr. Bill Cheeseman
Plant Engineer
Channel Landfill Co.
Post Office Box 1267
Juneau, Alaska 99801
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Channel
Landfill (Juneau) Incinerator
cc: EPA Region X Office and Alaska Department of Environmental
Conservation, Juneau, Alaska

Mr. Jim Thomas
Plant Engineer
North Slope Borough
Post Office Box 340044
Prudhoe Bay, Alaska 99734
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Prudhoe Bay
Borough Municipal Incinerator
cc: EPA Region X Office and Alaska Department of Environmental
Conservation, Juneau, Alaska

Mr. Doo Nam Lee
Executive Director
HECOR, Inc.
Post Office Box 6328
Anchorage, Alaska 99502
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Korean Airlines
(Anchorage) Municipal Incinerator
cc: EPA Region X Office and Alaska Department of Environmental
Conservation, Juneau, Alaska

Mr. Jim Shirrell
Mayor
City of Batesville
Municipal Building
170 S. Forth Street
Batesville, Arkansas 72501
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Batesville City
Incinerator
cc: EPA Region VI Office and Arkansas Department of Pollution Control and
Ecology, Little Rock, Arkansas

Mr. Homer Moore
City Hall
City Incinerator
Blythesville, Arkansas 72315
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Blythesville
City Incinerator
cc: EPA Region VI Office and Arkansas Department of Pollution Control and
Ecology, Little Rock, Arkansas

Mr. Tony Porterfield
Hot Springs City Sanitation Department
218 Runyon Street
Hot Springs, Arkansas 71901
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Hot Springs
City Incinerator
cc: EPA Region VI Office and Arkansas Department of Pollution Control and
Ecology, Little Rock, Arkansas

Mr. David Helms
J.D. Helms Co., Inc.
12 Fairmont Drive
Little Rock, Arkansas 72204
Paragraph 3, line 1: Sitka Municipal Incinerator changed to North Little
Rock Municipal Incinerator
cc: EPA Region VI Office and Arkansas Department of Pollution Control and
Ecology, Little Rock, Arkansas

Mr. R. E. Prewitt
Mayor
City Hall
City of Osceola
316 W. Hale Street
Osceola, Arkansas 72370
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Osceola City
Incinerator
cc: EPA Region VI Office and Arkansas Department of Pollution Control and
Ecology, Little Rock, Arkansas

Mr. Frank Dent
Stuttgart Incinerator
514 S. Main Street
Stuttgart, Arkansas 72160
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Stuttgart
Municipal Incinerator
cc: EPA Region VI Office and Arkansas Department of Pollution Control and
Ecology, Little Rock, Arkansas



Mr. John Eppich
Project Manager
Commerce Refuse-to-Energy Authority
Post Office Box 4998
Whittier, California 90607
Paragraph 3, line 1: Sitka Municipal Incinerator changed to City of
Commerce Municipal Incinerator
cc: EPA Region IX Office and California Air Resources Board, Sacramento,
California

Mr. Fred Mazzella
Assistant Supervisor
New Canaan Incinerator
77 Main Street
New Canaan, Connecticut 06840
Paragraph 3, line 1: Sitka Municipal Incinerator changed to New Canaan
Incinerator
cc: EPA Region I Office and Connecticut Department of Environmental
Protection, Air Compliance Unit, Hartford, Connecticut

Mr. Alex Covell
Connecticut Resource Recovery Authority
6 Howard Avenue
Bridgeport, Connecticut 06605
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Bridgeport
Municipal Incinerator
cc: EPA Region I Office and Connecticut Department of Environmental
Protection, Air Compliance Unit, Hartford, Connecticut

Mr. Marvin Serra
Superintendent of Sanitation
City of Stamford/Incineration
888 Washington Blvd.
Stamford, Connecticut 06904-2152
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Stamford City
Incinerator
cc: EPA Region I Office and Connecticut Department of Environmental
Protection, Air Compliance Unit, Hartford, Connecticut

Mr. Norman French
First Selectman
Town Office
Town of Windham
979 Main Street
Willimantic, Connecticut 06226
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Windham Town
Incinerator
cc: EPA Region I Office and Connecticut Department of Environmental
Protection, Air Compliance Unit, Hartford, Connecticut

Mr. Richard Moreland
Acting Administrator
Public Space Maintenance Administration
District of Columbia Department of Public Works
4701 Shepherd Parkway S.W.
Washington, District of Columbia 20032
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Washington,
District of Columbia Municipal Incinerator
cc: EPA Region III Office and District of Columbia Department of Consumer
and Regulatory Affairs, Washington District of Columbia

Mr. Pasquale Canzano
Chief Engineer
Delaware Solid Waste Authority
Post Office Box 455
Dover, Delaware 19901
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Wilmington
Municipal Incinerator
cc: EPA Region III Office and Delaware Department of Natural Resources and
Environmental Control, Division of Air and Waste Management, Dover, Delaware

Ms. Jeanne Massa
Dade County
Metro Dade Center
111 N.W. 1st Street, 16th Floor
Miami, Florida 33128
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Dade County
Municipal Incinerator
cc: EPA Region IV Office and Florida State Agency, Department of
Environmental Regulation, Tallahassee, Florida

Mr. Dary Smith
Director, Resource Recovery Program
Hillsborough County
Department of Solid Waste
Post Office Box 1110
Tampa, Florida 33601
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Hillsborough
County Municipal Incinerator
cc: EPA Region IV Office and Florida State Agency, Department of
Environmental Regulation, Tallahassee, Florida

Mr. Paul Alley
Project Manager
Monteney KW Corporation
Post Office Box 5708
Key West, Florida 33045-5708
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Key West
Municipal Incinerator
cc: EPA Region IV Office and Florida State Agency, Department of
Environmental Regulation, Tallahassee, Florida

Mr. Charles Garing
City of Lakeland
Department of Electric & Water Utilities
1000 E. Parker Street
Lakeland, Florida 33801
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Lakeland City
Municipal Incinerator
cc: EPA Region IV Office and Florida State Agency, Department of
Environmental Regulation, Tallahassee, Florida

Ms. Vivian Baseman
Project Manager
International Research & Development
Post Office Box 266
Mayport, Florida 32228-0266
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Mayport Naval
Station Municipal Incinerator
cc: EPA Region IV Office and Florida State Agency, Department of
Environmental Regulation, Tallahassee, Florida

Mr. Bob Van Deman
Director, Solid Waste Management Department
Pinellas County
2800 110 Avenue North
St. Petersburg, Florida 33702
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Pinellas County
Municipal Incinerator
cc: EPA Region IV Office and Florida State Agency, Department of
Environmental Regulation, Tallahassee, Florida

Ms. Nancy McCaan
City of Tampa/McKay Bay Project
City Hall Plaza
5 North
Tampa, Florida 33602
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Tampa City
Municipal
cc: EPA Region IV Office and Florida State Agency, Department of
Environmental Regulation, Tallahassee, Florida

Mr. Horace Magwood
Director of Sanitation
City of Savannah
Post Office Box 1027
Savannah, Georgia 31402
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Savannah City
Municipal Incinerator
cc: EPA Region IV Office and Georgia Environmental Protection Division,
Department of Natural Resources, Atlanta, Georgia

A-9

Mr. Frank Doyle
Chief, Division of Refuse Collection
and Disposal
Department of Public Works
650 South King Street
City and County of Honolulu
Honolulu, Hawaii 96813
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Honolulu
Municipal Incinerator
cc: EPA Region IX Office and Hawaii Environmental Protection and Health
Services Division, Hawaii State Department of Health, Honolulu, Hawaii

Mr. Arnold Chatland
Director, City of Ames
Department of Public Works
125 S. 3rd Street
Ames, Iowa 50010
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Ames City
Municipal Incinerator
cc: EPA Region VII and Iowa Department of Natural Resources, Des Moines,
Iowa

Mr. Max Durfee
Plant Manager
Thermal Reduction Co, Inc.
Post Office Box 548
Heyburn, Idaho 83336
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Burley (Cassia
County) Municipal Incinerator
cc: EPA Region X Office and Idaho Department of Health and Welfare,
Division of Environment, Boise, Idaho

Mr. Emil Nigro
Coordinating Engineer
Department of Streets and Sanitation
121 N. LaSalle Street
City Hall, Room 704
Chicago, Illinois 60602
Paragraph, 3, line 1: Sitka Municipal Incinerator changed to Chicago
Municipal Incinerator
cc: EPA Region V Office and Illinois Environmental Protection Agency,
Springfield, Illinois

Mr. Joseph Rakowski
Superintendent of Solid Divisions
East Chicago Municipal Incinerator
5400 Cline Avenue
East Chicago, Indiana 46312
Paragraph 3, line 1: Sitka Municipal Incinerator changed to East Chicago
Municipal Incinerator
cc: EPA Region V Office and Indiana Department of Environmental Management,
Indianapolis, Indiana

City Manager
City of Franklin
City Hall
Attn: Incineration
Franklin, Kentucky 42134
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Franklin City
Municipal Incinerator
cc: EPA Region IV Office and Kentucky Division of Air Pollution Control,
Department for Environmental Protection, Frankfort, Kentucky

Mr. Dennis Minks
Technical Operations Manager
Louisville Municipal Incinerator
636 Meriwether Street
Louisville, Kentucky 40217
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Louisville
Municipal Incinerator
cc: EPA Region IV Office and Kentucky Division of Air Pollution Control,
Department for Environmental Protection, Frankfort, Kentucky

Mr. John Souza
Fall River Municipal Incinerator
10 Lewiston Street
1 Government Building
Fall River, Massachusetts 02722
Paragraph 3, line 1: Sitka municipal Incinerator changed to Fall River
Municipal Incinerator
cc: EPA Region I Office and Massachusetts Division of Air Quality Control,
Boston, Massachusetts

Mr. Danny Romani
Framingham Public Works Division
Memorial Building
Framingham, Massachusetts 01701
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Framingham
Municipal Incinerator
cc: EPA Region I Office and Massachusetts Division of Air Quality Control,
Boston, Massachusetts

A-11

Mr. James Ricci
Vice President
Refuse Fuels, Inc.
100 Recovery Way

Haverhill, Massachusetts 01830

Paragraph 3, line 1: Sitka Municipal Incinerator changed to Haverhill and
Lawrence Municipal Incinerator

cc: EPA Region I Office and Massachusetts Division of Air Quality Control,
Boston, Massachusetts

Mr. George Chretien
Principal Engineer
Charles Street

North Andover, Massachusetts 01845

Paragraph 3, line 11: Sitka Municipal Incinerator changed to North Andover
Municipal Incinerator

cc: EPA Region I Office and Massachusetts Division of Air Quality Control,
Boston, Massachusetts

Mr. Lew Clark
Vicon Recovery Systems
500 Hubbard Avenue

Pittsfield, Massachusetts 01201

Paragraph 3, line 1: Sitka Municipal Incinerator changed to Pittsfield
Municipal Incinerator

cc: EPA Region I Office and Massachusetts Division of Air Quality Control,
Boston, Massachusetts

Mr. Michael Gagliardo
NE Maryland Waste Disposal Authority
Redwood Center, Suite 503
131 E. Redwood Street

Baltimore, Maryland 21202

Paragraph 3, line 1: Sitka Municipal Incinerator changed to Baltimore City
Municipal Incinerator

cc: EPA Region III Office and Maryland Air Management Administration,
Office of Environmental Programs, Baltimore, Maryland

Mr. Robert Herrmann
National Ecology, Inc.
16 Greenmeadow Drive

Timonium, Maryland 21093

Paragraph 3, line 1: Sitka Municipal Incinerator changed to Baltimore
County Municipal Incinerator

cc: EPA Region III Office and Maryland Air Management Administration,
Office of Environmental Programs, Baltimore, Maryland

Ms. Robin Depot
Project Manager
NE Maryland Waste Disposal Authority
Redwood Center, Suite 503
131 E. Redwood Street
Baltimore, Maryland 21202
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Harford County
Municipal Incinerator
cc: EPA Region III Office and Maryland Air Management Administration,
Office of Environmental Programs, Baltimore, Maryland

Mr. Robert Atkinson
Auburn Energy Recovery Facility
Goldthwaite Road
Auburn, Maine 04210
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Auburn
Municipal Incinerator
cc: EPA Region I Office and Maine Department of Environmental Protection,
Bureau of Air Quality Control, Augusta, Maine

Mr. Steve DeWick
Engineer
Kimball Chase Company
53 Front Street
Bath, Maine 04530
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Harpswell
Municipal Incinerator
cc: EPA Region I Office and Maine Department of Environmental Protection,
Bureau of Air Quality Control, Augusta, Maine

Mr. Norman Syn
Supervisor
Northern Aroostook Regional
Incinerator Facility
Post Office Box 146
Frenchville, Maine 04745
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Northern
Aroostook Regional Incinerator
cc: EPA Region I Office and Maine Department of Environmental Protection,
Bureau of Air Quality Control, Augusta, Maine

Mr. Steve Walker
Highway Department Head
Municipal Town Garage
Windham Center Road
Windham, Maine 04062
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Windham
Municipal Incinerator
cc: EPA Regional I Office and Maine Department of Environmental Protection,
Bureau of Air Quality Control, Augusta, Maine

A-13

Mr. John Lamerato
Assistant General Manager
S.E. Oakland County Incinerator Authority
Post Office Box 721248
Berkley, Michigan 48072
Paragraph 3, line 1: Sitka Municipal Incinerator changed to S.E. Oakland
County (Madison Heights) Municipal Incinerator
cc: EPA Region V Office and Michigan Air Quality Division, Michigan
Department of Natural Resources, Lansing, Michigan

Mr. Ed Whedon
General Manger
Clinton Township Incinerator
33701 Lipke Road
Mt. Clemons, Michigan 48043
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Clinton
Township Incinerator
cc: EPA Region V Office and Michigan Air Quality Division, Michigan
Department of Natural Resources, Lansing, Michigan

Mr. Donald Wilson
Director, Public Works
Jackson Board of Public Works
120 Michigan Avenue
Jackson, Michigan 49201
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Jackson
Municipal Incinerator
cc: EPA Region V Office and Michigan Air Quality Division, Michigan
Department of Natural Resources, Lansing, Michigan

Mr. Dennis Nagle
Pope-Douglas Joint Solid Waste Board
County Incinerator Zoning Department
Courthouse
Alexandria, Minnesota 56308
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Pope and
Douglas Counties (Alexandria) Municipal Incinerator
cc: EPA Region V Office and Minnesota Pollution Control Agency, St. Paul,
Minnesota

Mr. Gary Baker
Western Lake Superior Sanitary District
27th Avenue West & The Waterfront
Duluth, Minnesota 55806
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Duluth
Municipal Incinerator
cc: EPA Region V Office and Minnesota Pollution Control Agency, St. Paul,
Minnesota

Mr. Jerry Kenny
Manager
Northern State Power Company
2nd and Line Street
Mankato, Minnesota 56001
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Mankato
Municipal Incinerator
cc: EPA Region V Office and Minnesota Pollution Control Agency, St. Paul,
Minnesota

Mr. Dayle Johnson
Quadrant Company
215 S. Cascade Street
Fergus Falls, Minnesota 56537
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Perham
Municipal Incinerator
cc: EPA Region V Office and Minnesota Pollution Control Agency, St. Paul,
Minnesota

Mr. Mark Bobman
Solid Waste Officer
Post Office Box 27
Crookston, Minnesota 56716
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Polk County
Municipal Incinerator
cc: EPA Region V Office and Minnesota Pollution Control Agency, St. Paul,
Minnesota

Mr. Dean Massett
Council Administrator
City of Red Wing
Post Office Box 34
Red Wing, Minnesota 55066
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Red Wing
Municipal Incinerator
cc: EPA Region V Office and Minnesota Pollution Control Agency, St. Paul,
Minnesota

Mr. Byron Richards
Richards Asphalt Company
12101 Yosemite Avenue South
Savage, Minnesota 55378
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Savage
(Richards Asphalt) Municipal Incinerator
cc: EPA Region V Office and Minnesota Pollution Control Agency, St. Paul,
Minnesota

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Mr. Michael Cousino
Director of Public Works
2122 Campus Drive, S.E.
Rochester, Minnesota 55904
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Olmstead County
(Rochester) Municipal Incinerator
cc: EPA Region V Office and Minnesota Pollution Control Agency, St. Paul,
Minnesota

Mr. Dick Dismore
Chief, Utilities Division
Facility Engineers
Building 2204/AT2T-DEH-U
Ft. Leonard Wood, Missouri 65473
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Ft. Leonard
Wood Municipal Incinerator
cc: EPA Region VII Office and Missouri Department of Natural Resources,
Division of Environmental Quality, Air Pollution Control Program, Jefferson
City, Missouri

Mr. Lloyd Compton
Compton Engineering
Post Office Box 686
Pascagoula, Mississippi 39567
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Pascagoula
Municipal Incinerator
cc: EPA Region IV Office and Mississippi Department of Natural Resources,
Bureau of Pollution Control, Jackson, Mississippi

Mr. Ed Flatt
Manager
Park County Solid Waste District
414 E. Calendar Street
Livingston, Montana 59047
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Livingston
Municipal Incinerator
cc: EPA Region VIII Office and Montana State Department of Health and
Environmental Sciences, Air Quality Bureau, Helena, Montana

Mr. Fred Beach
Wrightsville Beach Public Works
200 Parmele Boulevard
Wrightsville Beach, North Carolina 28480
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Wrightsville
Beach Municipal Incinerator
cc: EPA Region IV Office and North Carolina Division of Environmental
Management, Raleigh, North Carolina

Mr. Daniel Carpenter
Auburn Municipal Incinerator
Post Office Box 999
Auburn, New Hampshire 03032
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Auburn
Municipal Incinerator
cc: EPA Region I Office and New Hampshire Air Resources Agency, Concord,
New Hampshire

Mr. Robert Kline
Board of Selectman
6 Post Office Square
Town of Plymouth
Plymouth, New Hampshire 03264
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Plymouth
Municipal Incinerator
cc: EPA Region I Office and New Hampshire Air Resources Agency, Concord,
New Hampshire

Ms. Kalene H. Roberts
Lincoln-Woodstock Municipal Waste Incinerator
Post Office Box 25
Lincoln, New Hampshire 03251
Paragraph 3, line 1: Sitka Municipal Incinerator changed to
Lincoln-Woodstock Municipal Incinerator
cc: EPA Region I Office and New Hampshire Air Resources Agency, Concord,
New Hampshire

Ms. Martha St. Amand
Town Manager
60 Old Bridge Street North
Pelham, New Hampshire 03076
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Pelham
Municipal Incinerator
cc: EPA Region I Office and New Hampshire Air Resources Agency, Concord,
New Hampshire

Selectman
12 Deerfield Road
Attn: Incinerator
Candia, New Hampshire 03034
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Candia
Municipal Incinerator
cc: EPA Region I Office and New Hampshire Air Resources Agency, Concord,
New Hampshire

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Mr. John Fife
Assistant Road Agent
Canterbury Incinerator
Baptist Road
Canterbury, New Hampshire 03224
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Canterbury
Incinerator
cc: EPA Region I Office and New Hampshire Air Resources Agency, Concord,
New Hampshire

Ms. Connie Leach
Project Manager
NH/VT Solid Waste Project
Room 336, Moody Building
Claremont, New Hampshire 03743
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Claremont
Municipal Incinerator
cc: EPA Region I Office and New Hampshire Air Resources Agency, Concord,
New Hampshire

Mr. Richard Rugg
Administrator
Lamprey Regional Solid Waste Cooperative
1 Lamprey Way
Durham, New Hampshire 03824-3585
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Durham
Municipal Incinerator
cc: EPA Region I Office and New Hampshire Air Resources Agency, Concord,
New Hampshire

Mr. Paul Jefts
James River Corporation
Mechanic Street
Groveton, New Hampshire 03582
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Groveton
Municipal Incinerator
cc: EPA Region I Office and New Hampshire Air Resources Agency, Concord,
New Hampshire

Selectman
Litchfield Incinerator
255 Chiles Bancroft Highway
Litchfield, New Hampshire 03051
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Litchfield
Incinerator
cc: EPA Region I Office and New Hampshire Air Resources Agency, Concord,
New Hampshire

Mr. Barry Weeks
Plant Manager
Meredith Municipal Refuse Incinerator
Town of Meredith
Meredith, New Hampshire 03253
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Meredith
Municipal Refuse Incinerator
cc: EPA Region I Office and New Hampshire Air Resources Agency, Concord,
New Hampshire

Mr. Phillip Fernald
Selectman
Post Office Box 114
Nottingham, New Hampshire 03290
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Nottingham
Municipal Incinerator
cc: EPA Region I Office and New Hampshire Air Resources Agency, Concord,
New Hampshire

Mr. Edward Frekey
Chairman
Pittsfield Solid Waste Facility
Route 28
Chichester, New Hampshire 03263
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Pittsfield
Municipal Incinerator
cc: EPA Region I Office and New Hampshire Air Resources Agency, Concord,
New Hampshire

Ms. Patti Moore
Manager
Wilton Recycle Center
Main Street, Box 83
Wilton, New Hampshire 03086
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Wilton
Municipal Incinerator
cc: EPA Region I Office and New Hampshire Air Resources Agency, Concord,
New Hampshire

Ms. Olive Champagne
First Operator
Wolfeboro Incinerator
Pine Hill Road
Town Office
Wolfeboro, New Hampshire 03894
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Wolfeboro
Municipal Incinerator
cc: EPA Region I Office and New Hampshire Air Resources Agency, Concord,
New Hampshire

Mr. Norm Hubbler
U.S. Army Corp of Engineers
Attn: NANEN-MA
NY District
26 Federal Plaza
New York, New York 10278
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Ft. Dix,
New Jersey Municipal Incinerator
cc: EPA Region II Office and New Jersey State Department of Environmental
Protection, Air Pollution Control Program, Trenton, New Jersey

Mr. Dan Dorlon
Eaco/Albany
79 N. Pearl Street
Albany, New York 12207
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Albany
Municipal Incinerator
cc: EPA Region II Office and New York Department of Environmental
Conservation, Division of Air Resources, Albany, New York

Mr. R. M. Johnson
Cattaraugus County
303 Court Street
Little Valley, New York 14755
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Cuba Municipal
Incinerator
cc: EPA Region II Office and New York Department of Environmental
Conservation, Division of Air Resources, Albany, New York

Mr. Scott Daniels
Commissioner of Solid Waste Management
Dutchess County
Van Dock Road
Poughkeepsie, New York 12601
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Dutchess County
Municipal Incinerator
cc: EPA Region II Office and New York Department of Environmental
Conservation, Division of Air Resources, Albany, New York

Mr. Robert Mangan
Director of Public Works
City of Glen Cove
Bridge Street
Glen Cove, New York 11542
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Glen Cove
Municipal Incinerator
cc: EPA Region II Office and New York Department of Environmental
Conservation, Division of Air Resources, Albany, New York

Ms. Margo Miles
Environmental Planner
Department of Environmental Control
Town Hall
100 Main Street
Huntington, New York 11743
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Huntington
Municipal Incinerator
cc: EPA Region II Office and New York Department of Environmental
Conservation, Division of Air Resources, Albany, New York

Mr. Michael Carpinello
Director
Bureau of Waste Disposal
125 Worth Street
New York, New York 10013
Paragraph 3, line 1: Sitka Municipal Incinerator changed to (Greenpoint and
Southwest) Brooklyn Incinerator
cc: EPA Region II Office and New York Department of Environmental
Conservation, Division of Air Resources, Albany, New York

Mr. Paul Gregory
Planner
Department of Sanitation
Office of Resource Recovery
51 Chambers Street, Room 830
New York, New York 10007
Paragraph 3, line 1: Sitka Municipal Incinerator changed to New York (Betts
Avenue) Incinerator
cc: EPA Region II Office and New York Department of Environmental
Conservation, Division of Air Resources, Albany, New York

Mr. Steve Devan
Deputy Commissioner
Oneida County Department of Public Works
Division of Solid Waste Management
River Road (NYS Rt. 365)
Rome, New York 13440
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Oneida County
Municipal Incinerator
cc: EPA Region II Office and New York Department of Environmental
Conservation, Division of Air Resources, Albany, New York

Mr. Robert Walsh
Deputy Superintendent for Solid Waste
County of Oswego
Rural Route #2, Box 184A
Fulton, New York 13069
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Oswego County
Incinerator
cc: EPA Region II Office and New York Department of Environmental
Conservation, Division of Air Resources, Albany, New York

Mr. Paul Lytle
Eastman Kodak Company
1669 Lake Avenue
ETS, Building 151, 2nd Floor
Rochester, New York 14650
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Rochester
(Eastman Kodak) Municipal Incinerator
cc: EPA Region II Office and New York Department of Environmental
Conservation, Division of Air Resources, Albany, New York

Mr. Ronald Patrick
Landfill and Water Superintendent
Skaneateles City Hall
24 Jordan Street
Skaneateles, New York 13152
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Skaneateles
Municipal Incinerator
cc: EPA Region II Office and New York Department of Environmental
Conservation, Division of Air Resources, Albany, New York

Mr. Calvin Weber
Deputy Commissioner
Solid Waste Management
County Office Bldg.
Room 522
White Plains, New York 10601
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Westchester
County Municipal Incinerator
cc: EPA Region II Office and New York Department of Environmental
Conservation, Division of Air Resources, Albany, New York

Mr. James Alkire
Director of Planning and Urban Development
City of Akron
401 Municipal Building
166 South High Street
Akron, Ohio 44308
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Akron Municipal
Incinerator
cc: EPA Region V Office and Ohio Environmental Protection Agency, Columbus,
Ohio

Mr. Clide Barger
Village Administrator
Post Office Box 51
Cedarville, Ohio 45314
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Cedarville
Municipal Incinerator
cc: EPA Region V Office and Ohio Environmental Protection Agency, Columbus,
Ohio

Mr. Henry Bell
 Administrator
 City of Columbus
 Division of Electricity
 95 W. Gay Street, 5th Floor
 Columbus, Ohio 43215
 Paragraph 3, line 1: Sitka Municipal Incinerator changed to Columbus City Incinerator
 cc: EPA Region V Office and Ohio Environmental Protection Agency, Columbus, Ohio

Mr. Lou Dommer
 Euclid City Incinerator
 27700 Lake Blvd.
 Euclid, Ohio 44132
 Paragraph 3, line 1: Sitka Municipal Incinerator changed to Euclid City Municipal Incinerator
 cc: EPA Region V Office and Ohio Environmental Protection Agency, Columbus, Ohio

Mr. John Horton
 Superintendent
 Solid Waste Management
 451 W. 3rd Street
 Dayton, Ohio 45422
 Paragraph 3, line 1: Sitka Municipal Incinerator changed to Montgomery County Incinerator
 cc: EPA Region V Office and Ohio Environmental Protection Agency, Columbus, Ohio

Ms. Sue Valliere
 Administrative Assistant
 Miami Resource Recovery, Inc.
 Post Office Box 309
 Miami, Oklahoma 74355
 Paragraph 3, line 1: Sitka Municipal Incinerator changed to Miami Municipal Incinerator
 cc: EPA Region VI Office and Oklahoma Air Quality Service, Environmental Health Services, Oklahoma State Department of Health, Oklahoma City, Oklahoma

Mr. Philip Richmond
 City of Tulsa
 470 W. 23rd Street
 Tulsa, Oklahoma 74107
 Paragraph 3, line 1: Sitka Municipal Incinerator changed to Tulsa City Incinerator
 cc: EPA Region VI Office and Oklahoma Air Quality Service, Environmental Health Services, Oklahoma State Department of Health, Oklahoma City, Oklahoma

Mr. William Strauss

Director

City of Harrisburg

Department of Incineration and Steam Generation

1670 S. 19th Street

Harrisburg, Pennsylvania 17101

Paragraph 3, line 1: Sitka Municipal Incinerator changed to Harrisburg Municipal Incinerator

cc: EPA Region III Office and Pennsylvania Department of Environmental Resources, Harrisburg, Pennsylvania

Mr. George Sharp

Plant Manager

Westmoreland Manor

Waste Energy Plant

2480 Grande Boulevard

Greensburg, Pennsylvania 15601

Paragraph 3, line 1: Sitka Municipal Incinerator changed to Westmoreland County Municipal Incinerator

cc: EPA Region III Office and Pennsylvania Department of Environmental Resources, Harrisburg, Pennsylvania

Mr. Fred Yelenik

Southland Exchange Joint Venture

Post Office Box 515

Hampton, South Carolina 29824

Paragraph 3, line 1: Sitka Municipal Incinerator changed to Hampton Municipal Incinerator

cc: EPA Region IV Office and South Carolina Department of Health and Environmental Control, Bureau of Air Quality Control, Columbia, South Carolina

Mr. Jim Denike

Wellman Industries, Inc.

Post Office Box 188

Johnsonville, South Carolina 29555

Paragraph 3, line 1: Sitka Municipal Incinerator changed to Johnsonville Municipal Incinerator

cc: EPA Region IV Office and South Carolina Department of Health and Environmental Control, Bureau of Air Quality Control, Columbia, South Carolina

Mr. Bob Kirk

Colonial Rubber Works, Inc.

Post Office Box 807

Dyersburg, Tennessee 38025

Paragraph 3, line 1: Sitka Municipal Incinerator changed to Dyersburg Municipal Incinerator

cc: EPA Region IV Office and Tennessee Division of Air Pollution Control, Nashville, Tennessee

Mr. Jerry Metcalf
Project Manager
625 Andrews Wire Road
Gallatin, Tennessee 37066
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Gallatin
Municipal Incinerator
cc: EPA Region IV Office and Tennessee Division of Air Pollution Control,
Nashville, Tennessee

Mr. Eddie Derryberry
City Manager
City of Lewisburg
505 N. Ellington Parkway
Post Office Box 332, Route 1
Lewisburg, Tennessee 37091
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Lewisburg
Municipal Incinerator
cc: EPA Region IV Office and Tennessee Division of Air Pollution Control,
Nashville, Tennessee

Mr. Kenny Lewis
Plant Manager
City of Carthage Municipal Incinerator
Post Office Box 400
Carthage, Texas 75633
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Carthage City
Incinerator
cc: EPA Region VI Office and Texas Air Control Board, Austin, Texas

Mr. Billy Hutchison
Plant Manager
City of Center Municipal Incinerator
1004 Shelbyville Street
Center, Texas 74935
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Center City
Incinerator
cc: EPA Region VI Office and Texas Air Control Board, Austin, Texas

Mr. Lloyd Moss
City Manager
City of Cleburne
Post Office Box 657
Cleburne, Texas 76031
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Cleburne City
Municipal Incinerator
cc: EPA Region VI Office and Texas Air Control Board, Austin, Texas

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Mr. James McGlouthlin
110 N. 8th Street
Gatesville, Texas 76528
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Gatesville
Municipal Incinerator
cc: EPA Region VI Office and Texas Air Control Board, Austin, Texas

Mr. James Young
Energy Recovery
Special Service District
Post Office Box 671
Layton, Utah 84041
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Davis County
Municipal Incinerator
cc: EPA Region VIII Office and Utah Department of Health, Division of
Environment, Bureau of Air Quality, Salt Lake City, Utah

Mr. Dayton Cook
Director of Transportation and
Environmental Services
City of Alexandria
Box 178
Alexandria, Virginia 22313
Paragraph 3, line 1: Sitka Municipal Incinerator changed to
Alexandria/Arlington Municipal Incinerator
cc: EPA Region III Office and Virginia State Air Pollution Control Board,
Richmond, Virginia

Mr. W. Harold Snead
City Manager
City of Galax
123 N. Main Street
Galax, Virginia 24333
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Galax City
Municipal Incinerator
cc: EPA Region III Office and Virginia State Air Pollution Control Board,
Richmond, Virginia

Mr. Clifton Loveland
Plant Manager
Refuse-Fired Steam Generating Facility
50 Wythe Creek Road
Hampton, Virginia 23666
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Hampton
Municipal Incinerator
cc: EPA Region III Office and Virginia State Air Pollution Control Board,
Richmond, Virginia

Mr. Roger Baker
Assistant City Manager
City of Harrisonburg
Municipal Building
345 S. Main Street
Harrisonburg, Virginia 22801
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Harrisonburg
City Incinerator
cc: EPA Region III Office and Virginia State Air Pollution Control Board,
Richmond, Virginia

Mr. Thomas Jennings
Chief
Public Works Division
DEH Bldg. 1407
Ft. Eustis, Virginia 23604
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Newport News
Municipal Incinerator
cc: EPA Region III Office and Virginia State Air Pollution Control Board,
Richmond, Virginia

Commanding Officer
Navy Public Works Center
Attn: Director of Utilities
Norfolk, Virginia 23511
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Norfolk
Municipal Incinerator
cc: EPA Region III Office and Virginia State Air Pollution Control Board,
Richmond, Virginia

Mr. Thomas Perotti
Plant Manager
Southeastern Public Service Authority of Virginia
#4 Victory Boulevard
Portsmouth, Virginia 23705
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Portsmouth
Municipal Incinerator
cc: EPA Region III Office and Virginia State Air Pollution Control Board,
Richmond, Virginia

Commander
Norfolk Naval Shipyard
Attn: Public Works Officer
Code 400
Portsmouth, Virginia 23709
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Portsmouth
cc: EPA Region III Office and Virginia State Air Pollution Control Board,
Richmond, Virginia

Mr. Randolph Smith
City Manager
City of Salem
Post Office Box 869
Salem, Virginia 24153-0809
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Salem City
Incinerator
cc: EPA Region III Office and Virginia State Air Pollution Control Board,
Richmond Virginia

Mr. James Dohrman
District Manager
Rutland County Solid Waste District
Post Office Box 965
Rutland, Vermont 05071
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Rutland
Municipal Incinerator
cc: EPA Region I Office and Vermont Agency of Environmental Conservation,
Air Pollution Control, Waterbury, Vermont

Mr. Bob Tool
Town of Readsboro
Post Office Box 246
Readsboro, Vermont 05350
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Readsboro
Municipal Incinerator
cc: EPA Region I Office and Vermont Agency of Environmental Conservation,
Air Pollution Control, Waterbury, Vermont

Ms. Janet Gardner
Town Treasurer
Town of Stamford
Rural Route #1
Box 718
Stamford, Vermont 05352
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Stamford
Municipal Incinerator
cc: EPA Region I Office and Vermont Agency of Environmental Conservation,
Air Pollution Control, Waterbury, Vermont

Mr. James Anderson
President
Thermal Reduction, Inc.
1524 Slater Road
Bellingham, Washington 98226
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Bellingham
Municipal Incinerator
cc: EPA Region X Office and Washington State Department of Ecology,
Olympia, Washington

William Barker
City of Tacoma
Department of Public Utilities
Post Office Box 11007
Tacoma, Washington 98411
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Tacoma City
Municipal Incinerator
cc: EPA Region X Office and Washington State Department of Ecology,
Olympia, Washington

Mr. William Englander
Solid Waste Program Manager
City of Bellingham
Public Works Department
210 Lottie Street
Bellingham, Washington 98225
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Bellingham City
Municipal Incinerator
cc: EPA Region X Office and Washington State Department of Ecology,
Olympia, Washington

Mr. Steve Klska
Environmental Engineer
Wisconsin Department of Natural Resources
Bureau of Air Management
Post Office Box 7921
Madison, Wisconsin 53707
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Barron County
Municipal Incinerator
cc: EPA Region V Office and Wisconsin Department of Natural Resources,
Bureau of Air Management, Madison, Wisconsin

Solid Waste Manager
La Crosse County
County Courthouse #208
400 N. Fourth Street
La Crosse, Wisconsin 54601
Paragraph 3, line 1: Sitka Municipal Incinerator changed to La Crosse
County Municipal Incinerator
cc: EPA Region V Office and Wisconsin Department of Natural Resources,
Bureau of Air Management, Madison, Wisconsin

Mr. James Aehl
Public Relations Manager
Oscar Mayer
910 Mayer Ave.
Madison, Wisconsin 53704
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Madison (Oscar
Mayer) Incinerator
cc: EPA Region V Office and Wisconsin Department of Natural Resources,
Bureau of Air Management, Madison, Wisconsin

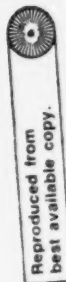
Mr. David Benzschawel
City of Madison
Division of Engineering
City-County Building, Room 107-A
Madison, Wisconsin 53709
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Madison City
Municipal Incinerator
cc: EPA Region V Office and Wisconsin Department of Natural Resources,
Bureau of Air Management, Madison, Wisconsin

Mr. Rodney Noven
Director
City of Waukesha
Public Works
201 Delafield Street
Waukesha, Wisconsin 53188
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Waukesha City
Municipal Incinerator
cc: EPA Region V Office and Wisconsin Department of Natural Resources,
Bureau of Air Management, Madison, Wisconsin

Mr. Bob Dreblow
Director of Public Works
100 West Grand Avenue
Port Washington, Wisconsin 53074
Paragraph 3, line 1: Sitka Municipal Incinerator changed to Port Washington
Municipal Incinerator
cc: EPA Region V Office and Wisconsin Department of Natural Resources,
Bureau of Air Management, Madison, Wisconsin

APPENDIX B

LIST OF RESPONDING MWC FACILITIES



MUNICIPAL WASTE COMBUSTION INFORMATION REQUEST LOG OF RECEIVED SURVEYS (as of 12/19/88)

SURVEY NUMBER	FACILITY	CITY	ZIP CODE	DISPOSAL SITE	CITY/COUNTY	ST	CONTACT	PHONE NUMBER
1	Osage County Energy Recovery Facility	Fulton	NY 15069	Bristol Hill Landfill	Fulton	NY	Robert Walsh	(315) 592-7441
2	Perham Resource Recovery Facility	Perham	NH 56573	M.E. Otter Tail Co.	Perham	NH	Mike Hanson	(218) 739-2291
3	Nashville Thermal	Nashville	IN 57201	Nashville Public Works	Nashville	IN	Peter Heidenreich	(615) 251-8600
4	Harrisburg Waste-to-Energy Facility	Harrisburg	PA 17104	(On-site disposal)	Harrisburg	PA	Harrisburg	(717) 236-5361
5	Pope-Douglas Waste-to-Energy Facility	Alexandria	NH 56308	Carlos Sanitary Landfill	Douglas County	NH		(612) 852-7344
6	City of Columbus Municipal Electric Plant	Columbus	OH 43103	Franklin County Landfill	Columbus	OH	Jim Mentle	(614) 871-9528
7	James River Corp. Commun. Papers Business	Groveton	NH 03582		Stark	NH	James River Corp	(603) 636-1154
8	Louisville Refuse Incinerator	Louisville	KY 40217	Edith Avenue	Louisville	KY		(502) 625-3571
9	Philadelphia Northwest Incinerator	Philadelphia	PA 19127	(Transfer station reported)	Philadelphia	PA	J. Paulino & Sons	(215) 724-1600
10	Philadelphia East Central Incinerator	Philadelphia	PA 19123	(Transfer station reported)	Philadelphia	PA	J. Paulino & Sons	(215) 724-1600
11	M. Aroostook Regional Incinerator Facility	Frenchville	ME 04745	(On-site disposal)	Frenchville	ME	Norman Cyr	(207) 543-6372
12	Steam Plant No. 2	Tacoma	WA 98411	(Facility not operating yet)		WA	Patrick McCarty	(206) 593-8336
13	Wellman, Inc.	Johnsonville	SC 29555	(Operation terminated)		SC	Daniel Dietz	(803) 386-2011
14	Grosse Pointe/Clinton Disposal Authority	Mt. Clement	MI 48043	St. Clair County Landfill	(Outside contractors)	MI	Edwin Whedon	(313) 792-2750
15	Framingham Reduction Plant	Framingham	MA 01701	Oyden Martin Sys of Haverhill	Haverhill	MA		(617) 374-7822
16	Wrightsville Beach Municipal Incinerator	Wrightsville	NC 28480	New Hanover Cty Secure LF	New Hanover	NC	Lyatt Blanchard	(919) 341-7139
17	Beaver Hill Disposal Site	Coquille	OR 97423	Bandon Disposal Site	Bandon	OR	Skip Sumstine	(503) 396-5444
18	Plymouth Incinerator/Recycling Facility	Plymouth	NH 03264	(On-site disposal)	Plymouth	NH	Robert Kline	(603) 536-1623

MUNICIPAL WASTE COMBUSTION INFORMATION REQUEST - LOG OF RECEIVED SURVEYS (as of 12/19/88)

SURVEY NUMBER	FACILITY	CITY	ST	ZIP CODE	DISPOSAL SITE	CITY/COUNTY	ST	CONTACT	PHONE NUMBER
19	Salvage Fuel Boiler Plant	Horfolk	VA	23511	..	Suffolk	VA	Jennifer Ladd	(804) 420-4700
20	Pinellas County Resource Recovery Facility	St Petersburg	FL	33716	28th St and 110th Ave.	St. Petersburg	FL	Robert Van Daman	(813) 892-7565
21	Fort Dix Resource Recovery Facility	Fort Dix	NJ	08640	Bottom - Parklands Reclamation	Bordentown	NJ	Veronica Phelan	(609) 298-8332
21	Fort Dix Resource Recovery Facility	Fort Dix	NJ	08640	Fly - Interstate Waste Removal	..	..	John, Wymore	(609) 587-1500
22	City of Waukesha Municipal Incinerator	Waukesha	WI	53186	Muskego Landfill	..	WI	Waste Mgmt	(414) 549-8100
23	Lewisburg Solid Waste Incinerator	Lewisburg	TN	37091	Darnell Road Landfill	Lewisburg	TN	John Derryberry	(615) 359-1644
24	Stuttgart Incinerator	Stuttgart	AR	72160	Stuttgart Landfill	Stuttgart	AR	Andrew Robinson	(501) 673-3111
25	Sumner City Solid Waste Recovery Facility	Gallatin	TN	37066	Sumner County Landfill	Hendersonville	TN	Steve Canter	(615) 452-1114
26	McIntosh Power Plant	Lakeland	FL	33605	(Zero Discharge Facility - ash recycled w/in system)	Charles Garing	(813) 666-5575		
27	Ames Electric Plant	Ames	IA	50010	(Zero Discharge Disposal Pond used onsite)	Gary Titus	(515) 239-5176		
28	Sheboygan Incinerator	Sheboygan	WI	53081	Section 28 TISM, R23E	Sheboygan	WI	Frank Calco	(414) 459-3458
29	City of Auburn Energy Recovery Facility	Auburn	ME	04210	Bottom - City of Auburn Ash LF	Auburn	ME	City Engineer	(217) 786-2421
29	City of Auburn Energy Recovery Facility	Auburn	ME	04210	Fly - Evergreen Landfill	Northwood	OH	..	(617) 872-5000
30	Western Lake Superior Sanitary District	Duluth	MN	55806	(On site disposal)	Duluth	MN	Gary Baker	(218) 722-3336
31	Occidental Chem. Corp. - Energy From Waste	Niagara Falls	NY	14304	Browning Ferris Industries	Niagara Falls	NY	Paul Barley	(716) 873-7500
32	Harrisonburg Resource Recovery Facility	Harrisonburg	VA	22801	Harrisonburg Landfill	Harrisonburg	VA	..	(703) 434-8551
33	Dyersburg Municipal Incinerator	Dyersburg	TN	38024	Dyer County Landfill	Dyersburg	VA	William Revell	(901) 286-7600
34	Town of Candia Incinerator	Candia	NH	03034	..	Rochester	MH	Paul Fenlor	1 800 443-5515

MUNICIPAL WASTE COMBUSTION INFORMATION REQUEST - LOG OF RECEIVED SURVEYS (as of 12/19/88)

SURVEY NUMBER	FACILITY	CITY	ST	ZIP CODE	DISPOSAL SITE	CITY/COUNTY	ST	CONTACT	PHONE NUMBER
35	Windham Municipal Incinerator	Windham	ME	04062	Windham Municipal Incin. Site	Windham	ME	Steve Walker	(207) 892-4262
36	New Canaan Municipal Incinerator	New Canaan	CT	06840	New Canaan Municipal Landfill	New Canaan	CT	..	(203) 972-0181
37	Park County Refuse Energy	Livingston	MT	59047	Park County Landfill	Livingston	MT	..	(406) 222-6232
38	City of Akron Recycle Energy System	Akron	OH	44307	Hardy Road Landfill	Akron	OH	Mitch Alvis	(216) 928-8293
39	Fort Leonard Wood	Fort Leonard Wd	MO	65401	(On site disposal)	Fort Leonard Wood	MO	Emily Brown	(314) 368-6108
40	Bay County Resource Management Facility	Panama City	FL	32404	Bay County Landfill	Bay County	FL	Robert Oldland	(904) 784-4000
41	Madison Area Resource Recovery Center	Madison	WI	53713	Madison/Prairie Landfill	Madison	WI	..	(608) 249-4323
41	Madison Area Resource Recovery Center	Madison	WI	53713	City of Madison Landfill	Madison	WI	Dept Streets/San.	(608) 246-4532
42	Northwest Waste Energy Facility	Chicago	IL	60624	Forest Lawn Landfill	Three Oaks	MI	..	(616) 756-4252
43	Westmoreland Manor Waste To Energy	Greensburg	PA	15601	Sanitary Landfill	Monessen	PA	MAUC	(412) 834-6500
44	French Island Generating Facility	La Crosse	WI	54603	La Crosse County Landfill	La Crosse	WI	Mike Zion	(608) 785-9572
45	Wilmarth Steam Plant	Marikato	MI	56001	Red Wing Landfill	Red Wing	MI	Mark Gann	(612) 330-6359
45	Red Wing BDF Power Plant	Red Wing	MI	55066	Red Wing Landfill	Red Wing	MI	Mark Gann	(612) 330-6359
46	Batesville Waste to Energy Facility	Batesville	AR	72501	(On site disposal)	Batesville	AR	Robert Jones	(501) 793-3277
47	Waipahu Incinerator	Waipahu	HI	96797	(On site disposal)	Waipahu	HI	Frank Doyle	(808) 527-5358
48	Commerce Refuse-to-Energy Facility	Commerce	CA	90040	Puente Mills Landfill	Whittier	CA	Ray Muiric	(213) 699-7411
49	Montenay KU Corporation	Key West	FL	33045	Stock Island Landfill	Key West	FL	Stock Island	(305) 294-3440
50	City of Waukegan Resource Recovery	Waukegan	IL	75165	City of Waukegan Sanitary LF	Waukegan	IL	Health Dept.	(214) 937-7330

MUNICIPAL WASTE COMBUSTION INFORMATION REQUEST - LOG OF RECEIVED SURVEYS (as of 12/19/88)

SURVEY NUMBER	FACILITY	CITY	ST	ZIP CODE	DISPOSAL SITE	CITY/COUNTY	ST	CONTACT	PHONE NUMBER
51	SE Oakland County Incinerator Authority	Madison Heights	MI	48071	SE Oakland Cty Incin. Auth. LF	Madison Heights	MI	Thomas Waffon	(313) 288-5150
52	Dade County Resource Recovery Facility	Miami	FL	33178	(On site disposal)	Miami	FL	Bill Worrell	(305) 375-1921
53	Sitka Solid Waste to Energy Facility	Sitka	AK	99835	Sitka Landfill	Sitka	AK	Larry Hanson	(907) 747-3294
54	Ontario Waste-to-Energy Facility	Rochester	MI	55904	Dodge County Landfill	Rochester	MI	John Helmers	(507) 285-8231
55	McKay Bay Refuse-to-Energy Facility	Tampa	FL	33605	Southeast County Landfill	Hillsborough Cty	FL	Patricia Berry	(813) 272-6674
56	Hampton Refuse-fired Steam Generating Fac.	Hampton	VA	23666	Present: Big Bethel Road LF	Hampton	VA	Williams of VA	(804) 420-1140
56	Hampton Refuse-fired Steam Generating Fac.	Hampton	VA	23666	1979-86: Magruder Blvd LF	Hampton	VA	Hampton Public Wks	(804) 727-6308
57	Cassia County Incinerator	Heyburn	ID	83336	Burley Landfill	Burley	ID	Timothy Hurst	(208) 678-7302
58	Solid Waste Reduction Center #1	Washington	DC	20019	St. Elizabeth Hospital	Washington	DC	Sylvestre Yorrick	(202) 727-5907
59	Red Wing Solid Waste Boiler Facility	Red Wing	MI	55066	City of Red Wing Sanitary LF	Red Wing	MI	Ron Bucholz	(612) 308-6796
60	Wilton Recycling Center	Wilton	MI	03086	Turnkey Landfill	Rochester	MI	Becky Sicrest	(603) 654-6150
60	Wilton Recycling Center	Wilton	MI	03086	B F I Landfill	--	MA	Becky Sicrest	(603) 654-6150
61	Walter B. Hall Resource Recovery	Tulsa	OK	74107	Claremore Municipal Landfill	--	--	Z. Samanishym	(201) 882-7328
62	Ogden Martin Systems of Marion Inc.	Brooks	OR	97305	Woodburn Landfill	--	OR	James Sears	(503) 393-0890
63	Osceola Waste to Energy Facility	Osceola	AR	72370	Riverport Landfill	Osceola	AR	--	(501) 563-3277
64	Ogden Martin Sys. of Alexandria/Arlington	Alexandria	VA	22304	Lorton I-95 Landfill	Lorton	VA	David Eger	(703) 246-5040
65	Lamprey Regional Solid Waste Cooperative	Durham	MI	03824	Newmarket Landfill	Newmarket	MI	Ron Bloom	(603) 659-3093
65	Lamprey Regional Solid Waste Cooperative	Durham	MI	03824	Stratham Landfill	Stratham	MI	Fred Mutton	(603) 772-5550

MUNICIPAL WASTE COMBUSTION INFORMATION REQUEST - LOG OF RECEIVED SURVEYS (as of 12/19/88)

SURVEY NUMBER	FACILITY	CITY	ST	ZIP CODE	DISPOSAL SITE	CITY/COUNTY	ST	CONTACT	PHONE NUMBER
65	Lamprey Regional Solid Waste Cooperative	Durham	NH	03824	Rollinsford Landfill	Rollinsford	NH	Edward Jensen	(603) 862-1700
65	Lamprey Regional Solid Waste Cooperative	Durham	NH	03824	Epping Landfill	Epping	NH	Russ Bailey	(603) 679-5441
66	Montgomery County North Incinerator	Dayton	OH	45414	Dayton W. Incinerator Landfill	Dayton	OH	John Morton	(513) 224-6145
67	Hillsborough Cnty SW Energy Recovery Fac.	Tampa	FL	33619	Hillsborough County Landfill	Tampa	FL	Patty Berry	(813) 272-6674
68	Hillbury Resource Recovery Facility	Hillbury	MA	01527	Shrewsbury Landfill	Shrewsbury	MA	Robert Tekach	(617) 791-8900
69	Refuse Energy System Company	Saugus	MA	01906	(On site disposal)	Saugus	MA	David Wojchowski	(617) 777-2207
70	Baltimore RESCO	Baltimore	MD	21230	Quarantine Landfill	Hawkins Point	MD	Edward May	(301) 396-4572
71	Westchester RESCO	Peekskill	NY	10566	Croton Point Landfill	Peekskill	NY	Anthony Carbone	(914) 285-2536
71	Westchester RESCO	Peekskill	NY	10566	Westchester County Landfill	Peekskill	NY	Anthony Carbone	(914) 285-2536
72	Duchess County Resource Recovery Facility	Poughkeepsie	NY	12601	Model City Landfill	Model City	NY	Dan Colpetzer	(713) 754-8226
73	Wheelabrator Environmental Systems	North Andover	MA	01845	Peabody Landfill	Peabody	MA	Mass. DECE	(617) 777-2207
74	Bridgeport RESCO	Bridgeport	CT	06604	Shelton Landfill	Shelton	CT	CBRA - Shelton LF	(203) 929-7139
75	New Hanover County HSM Recovery Facility	Wilmington	NC	28401	New Hanover Landfill	Wilmington	NC	C. Ed Milton, Jr.	(919) 341-7139
76	Cattaraugus County Waste-to-Energy Plant	Cuba	NY	14727	Allegany County Landfill	Angelica	NY	Fred Kelley	(716) 268-9236
76	Cattaraugus County Waste-to-Energy Plant	Cuba	NY	14727	Cattaraugus County Landfill	Ferrell	NY	Rick Johnson	(716) 938-9121
76	Cattaraugus County Waste-to-Energy Plant	Portsmouth	VA	23709	Mount Trashmore II Landfill	Virginia Beach	VA	Frank Emile	(804) 424-1100
77	Refuse Derived Fuel Steam Plant (US NAVY)	Stamford	VT	05352	(Waiting for State approval)	Rockingham	VT	Susan Bohl	(802) 604-1361
78	Stamford, Vermont Town Incinerator	Fergus Falls	MI	56537	Fergus Falls Municipal LF	Fergus Falls	MI	Dan Edwards	(218) 739-2251
79	Fergus Falls Waste to Energy Facility								

MUNICIPAL WASTE COMBUSTION INFORMATION REQUEST - LOG OF RECEIVED SURVEYS (as of 12/19/88)

SURVEY NUMBER	FACILITY	CITY	ST	ZIP CODE	DISPOSAL SITE	CITY/COUNTY	ST	CONTACT	PHONE NUMBER
80	Energy Generating Facility	New Castle	DE	19720	Cherry Island Landfill	Cherry Island	DE	Pat Hieutfield	(302) 571-3457
81	Port Washington Municipal Incinerator	Pt Washington	WI	53074	Omega Mills Landfill	German town	WI	Robert Drablow	(414) 284-2600
82	Long Beach Resource Recovery Facility	Long Beach	NY	11561	(Confidential - available upon written request)			Randolph Valley	(212) 949-0040
83	Pascagoula Energy Recovery Facility	Hose Point	MS	39563	McLand Landfill	Jackson County	MS	McLand Landfill	(601) 475-5682
84	Polk County SW Resource Recovery Plant	Foston	MI	56542	Polk County Sanitary Landfill	Gentilly	MI	Polk County SW	(218) 281-3952
85	Euclid Incinerator	Euclid	OH	44132	O.E.P.A. License Landfill		OH	Solid Waste Dept.	(216) 261-2323
86	OCS RDF Steam Generating Facility	Albany	NY	12210	Repp Road Landfill	Albany	NY	Daniel Dorlon	(518) 434-1227
87	Town of Skaneateles Transfer Station	Skaneateles	NY	13152	(Operation Terminated)			Russel Masters	(315) 685-6718
88	Davis Co. Waste-To-Energy Facility	Layton	UT	84041	Layton, Utah disposal site	Layton	UT	James Young	(801) 773-3032
89	Thermal Reduction Co., Inc.	Ferndale	WA	98248	(On Site Disposal)	Ferndale	WA	James Anderson	(206) 384-1057
90	Fall River Municipal Incinerator	Fall River	MA	02722	Airport Road Landfill	Fall River	MA	B. F. I.	(508) 678-2541
91	Blytheville Incinerator	Blytheville	AK	72315	Mississippi County Landfill		AK		(501) 658-2407
92	City of Carthage Resource Recovery Facility	Carthage	TX	75633	Panola County Sanitary LF	Carthage	TX	Robert Mithhauser	(214) 693-8342
93	Brookings Energy Facility	Brookings	OR	97415	Highway 101 Disposal Site	Brookings	OR	Peter Smart	(503) 449-2425
94	York County Waste-to-Energy Facility	Biddeford	ME	04005	Wenden, ME Disposal Site	Wenden	ME	Gary Bates	(207) 282-4127
95	Town of Auburn Incinerator	Auburn	WI	03032	(On Site Disposal)	Auburn	WI	Edward Labore Jr.	(603) 483-5052
96	Town of Readsboro Facility	Readsboro	VT	05350	(On Site Disposal)	Readsboro	VT	Robert Tool Jr.	(802) 423-7640
97	Inter-Community Incinerator	Elkhart Lake	WI	53020	(On Site Disposal)	Elkhart Lake	WI	Peter Menne	(414) 526-3648

MUNICIPAL WASTE COMBUSTION INFORMATION REQUEST LOG OF RECEIVED SURVEYS (as of 12/19/88)

SURVEY NUMBER	FACILITY	CITY	STATE	ZIP CODE	DISPOSAL SITE	CITY/COUNTY	STATE	CONTACT	PHONE NUMBER
98	Lincoln-Woodstock Incinerator	Lincoln	MA	0325	(On Site Disposal)	Lincoln	MA	Butch Conier	(603) 745-6626
99	Vilon Rutland Facility	Rutland	VT	0570	C & D Landfill	Chaffee	VT	John Moe	(716) 675-5516
99	Vilon Rutland Facility	Rutland	VT	0570	Mahoning Landfill	Youngstown	OH	Steve Detweiler	(215) 675-9796
100	Cleburne Resource Recovery Facility	Cleburne	TX	76031	City of Cleburne Landfill	Cleburne	TX	Fred Watson	(817) 641-2236
101	Litchfield Municipal Incinerator	Litchfield	MA	03051	Tourkesey Hill Landfill	Rochester	MA		1 800 847-5303
102	Salem Waste Disposal, Energy Recovery Plant	Salem	VA	24153	Twelve O'Clock Knob Road LF	Salem	VA	Earl Clabby	(703) 375-3039
103	Wincham Energy Recovery Facility	Williamstic	CT	06226	Yaworski Landfill	Lanctbury	CT	James Yaworski Sr.	(203) 546-9243
104	Galea Solid Waste Steam Recovery Plant	Galea	VA	24333	Carroll County Landfill	Carroll County	VA	Junior Vass	(703) 236-3691
105	City of Center - Resource Recovery Facility	Center	TX	75935	City of Center Landfill	Center	TX	Bertie Koonce	(409) 598-2055
106	North Slope Borough Service Area Ten	Prudhoe Bay	AK	99734	North Slope Borough Oxbow LF	Prudhoe Bay	AK	Mike Dieler	(407) 659-2635
107	Pulaski Company Limited Partnership	Baltimore	MD	21237	Quarantine Road Landfill	Baltimore	MD	Jake Bochinaki	(301) 485-9500
108	Chenel Landfill Inc.	Juneau	AK	99802	(On Site Disposal)	Juneau	AK	Gerald Wilson	(907) 780-4333
109	Glen Cove Sludge & Refuse Co-Disposal Caplx	Glen Cove	NY	11542	(Operator Did Not Respond)	Glen Cove	NY	Steve Passage	(516) 364-9880
110	Miami Resource Recovery Facility	Miami	FL	74354	(No Site Reported)			Ronald Grover	(918) 540-2561
111	Savannah Resource Recovery Facility	Savannah	GA	31404	P.O. box 1027	Savannah	GA	Gene Prevatt	(912) 235-4221
112	Pittsfield Resource Recovery Facility	Pittsfield	MA	01201	Pittsfield Municipal Landfill	Pittsfield	MA	William Forestell	(413) 499-9350
113	Barrow County Waste to Energy Facility	Albama	VI	54805	Sarona Township Landfill	Washburn County	VI	Jerry Curtis	(715) 234-7744
114	MA/VT Solid Waste Project	Clarendon	MA	03743	811 Rockingham Landfill	Springfield	VT	Kevin Greenwood	(802) 463-4621

MUNICIPAL WASTE COMBUSTION INFORMATION REQUEST - LOG OF RECEIVED SURVEYS (as of 12/19/86)

SURVEY NUMBER	FACILITY	CITY	ST	ZIP CODE	DISPOSAL SITE	CITY/COUNTY	ST	CONTACT	PHONE NUMBER
115	Onieda County Energy Recovery Facility	Rome	NY	13440	Onieda County Ash Landfill	Rome	NY	Steven Devlan	(315) 339-1990
116	Franklin Municipal Incinerator	Franklin	KY	42134	Butler County Landfill	Morgantown	KY	Jean West (Mauler)	(502) 566-7597
117	Wolfboro Solid Waste Disposal Facility	Wolfboro	NH	03894	(On Site Disposal)	Wolfboro	NH	Curtis Pike	(603) 569-3000
118	Pelham Incinerator Recycling Facility	Pelham	NH	03076	(On Site Disposal)	Pelham	NH	Albert Greenhalgh	(603) 635-3964
119	Mayport Naval Station Bldg 1430	Mayport	FL	32228	City of Jacksonville Landfill	Jacksonville	FL	Solid Waste Disp.	(205) 630-0973
120	Betts Avenue Incinerator	Woodsdale	NY	11377	Fresh Kills Landfill	Staten Island	NY	Michael Carpinello	(212) 566-3861
121	Jackson County Resource Recovery Facility	Jackson	MI	49201	(On Site Disposal)	Jackson	MI	Morman C. Bather	(517) 788-4008

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APPENDIX C

SAMPLE QUESTIONNAIRE

MUNICIPAL WASTE COMBUSTION
INFORMATION REQUEST

This information request is being sent to all municipal waste combustion facilities currently in operation or under construction. As provided in Section 114 of the Clean Air Act and Section 3007 of the Resource Conservation and Recovery Act, your facility is obligated to complete the attached information request and return it to EPA by not later than May 6, 1988.

The information request is divided into nine separate sections to aid in organization of information and completion of the questionnaire. The nine sections are:

- I. General Facility Information
- II. Municipal Waste Characterization
- III. Combustor Design and Operation
- IV. Air Pollution Control Devices
- V. Air Emissions Data
- VI. Solid Residue Generation
- VII. Residue Handling and Disposal
- VIII. Cost and Economic Information
- IX. Suggestions For Future Questionnaires

You may want to distribute specific sections of the questionnaire to other individuals within your organization. Please answer each question as completely as possible. Estimates and guesses should be indicated as such. If you are unable to respond to an item as it is stated, please provide any information you believe may be related. Use additional sheets or the backs of the request pages for your responses, if necessary. Please note the corresponding question number on any attached sheets or drawings and attach to the end of the questionnaire.

If you have questions regarding Sections II, VI, or VII, please contact Ms. Gerry Dorian of the U.S. Environmental Protection Agency at (202)475-7700. If you have questions regarding Sections I, III, IV, V, VIII, or IX, please contact Mr. Ron Myers of the U.S. Environmental Protection Agency at (919)541-5407.

Please return this information request and any additional information you wish considered to:

United States Environmental Protection Agency
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

Attention: Mr. Jack R. Farmer, ESD (MD-13)

After you have completed this information request, please estimate the time it required, in labor-hours: _____.

I: GENERAL FACILITY INFORMATION

NOTE: You are not required to generate new data. Only supply the data that is readily available to you.

I.1 a. Name of facility: _____

b. Address (do not use a P.O. Box):

Street: _____

City: _____ County: _____

State: _____ ZIP: _____

c. Plant latitude and longitude (to the nearest second, only if readily available):

Latitude: _____ Longitude: _____

If latitude and longitude are unknown, please indicate as specifically as possible where the facility is located (i.e., direction and distance from the nearest intersection of major city streets or State or U.S. highways):

d. Owner of facility: _____

e. Operator of facility: _____

f. Person responsible for completing questionnaire:

Name: _____

Title: _____ Phone No. _____

Mailing Address (if different from Question I.1.b, above):

Street: _____

City: _____ State: _____ ZIP: _____

I.2 Number of combustor units at facility (both operating and non-operating) by fuel and combustor type:

a. Mass burn

_____ Field-erected, moving grate stoker (often called mass burn combustor)

_____ Rotary combustor

_____ Modular, starved air

_____ Modular, excess air

_____ Other, (please specify): _____

b. RDF

_____ Spreader stoker

_____ Other, (please specify): _____

c. Co-fired

_____ Coal

_____ Sewage sludge

_____ Wood chips

_____ Other, (please specify): _____

I.3 What is the facility's current operating schedule?

a. Number of hours/day: _____

b. Number of days/week: _____

I.4 a. Surrounding land use:

_____ Industrial _____ Commercial _____ Residential _____ Rural

_____ Other (specify): _____

- b. Enclose a scaled plan view of the facility, labelled with combustor unit identification number(s) and showing the location of the waste receiving and holding facilities, incinerator(s), air pollution control device(s), and residue handling and storage facilities. The diagram should also show the overall dimensions of the site, distances between buildings, and from buildings to property boundaries. Also indicate on the diagram other installations such as parking lots, roads, rail lines, overhead structures (powerlines), underground structures (power cables, water lines), sewers, etc., which might restrict modification of the combustor or addition of air pollution control equipment. (If drawings are unavailable, please contact Mr. Ron Myers at (919) 541-5407.)

I.5

Operator Training

- a. Is operator training required by a local or State agency as a condition of plant operation? ☐ Yes ☐ No
If yes, please name the agency(s): _____

- b. How many hours of formal training are conducted in each of the following areas?

	Prior to Starting Work	During First Year of Employment	After First Year of Employment
MSW handling	_____	_____	_____
Combustor operation	_____	_____	_____
Air pollution control devices	_____	_____	_____
Residue handling	_____	_____	_____
Other (specify):	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

- c. Who conducts the training?

☐ In-house personnel ☐ Private contractor

☐ State or local agency

☐ Other (specify): _____

II. WASTE CHARACTERIZATION

NOTE: You are not required to generate new data. Only supply the data that is readily available to you.

II.1 Tonnage of waste received during each month in 1987:

1987

Jan	_____	July	_____
Feb	_____	Aug	_____
Mar	_____	Sept	_____
April	_____	Oct	_____
May	_____	Nov	_____
June	_____	Dec	_____

II.2 Percentage breakdown of wastes combusted by type:

<u>Source</u>	<u>Avg. percent</u>	<u>Range percent</u>
Residential	_____	_____ - _____
Commercial	_____	_____ - _____
Industrial	_____	_____ - _____
Other (specify below, e.g., from military installations, hospitals, government research facilities, industrial plants)	_____	_____ - _____

II.3 Is there a municipal recycling program? ☐ Yes ☐ No
☐ Unknown

a. If yes, what is recycled? (Please check)

_____ Newspapers _____ Bottles _____ Aluminum cans

Other (specify) _____

b. What percentage of your residential waste is collected in the area with the recycling program? _____

c. If possible, estimate the proportion of discards recycled.

____ Newspapers ____ Bottles ____ Aluminum cans

____ Other (specify) _____

11.4

Describe any waste processing that occurs at your facility or other processing facilities before the waste is burned:

a. Are combustibles removed?

____ Paper/Cardboard ____ Plastics ____ None

____ Bulky/Oversize Waste

____ Other (specify) _____

b. Are noncombustibles removed?

____ Glass ____ Metals ____ Batteries ____ None

____ Bulky/Oversize Waste

____ Other (specify) _____

c. What, if any, additional processing occurs?

____ Shredding ____ Baling ____ Pelletizing ____ None

____ Other (specify) _____

d. What percent of the total tonnage of waste received by your facility is typically segregated and disposed of by means other than combustion? _____

11.5

a. What is the capacity of your waste facility storage area?

_____ tons

b. Are separate piles of wet and dry garbage maintained?

_____ Yes _____ No

II.6

- a. Do you fire refuse derived fuel (RDF)? ☐ Yes ☐ No

If yes, please provide the following information:

- b. What is the nominal size range of the as-fired RDF, in inches?
Minimum: _____ Maximum: _____
- c. What percent by weight of the total municipal solid waste collected is removed during RDF processing? _____
- d. What percent of the total heat content of the municipal solid waste collected is removed during RDF processing? _____
- e. What is the percent ash content of the as-fired RDF? _____
- f. What is the average heating value of the as-fired RDF, Btu/lb? _____ (Is this value measured ☐ or estimated ☐)

II.7

- a. Is MSW co-fired with another fuel (excluding startup and shutdown)? ☐ Yes ☐ No

If yes, please provide the following information:

- b. Type of fuel co-fired:

☐ Wood ☐ Coal ☐ Sewage sludge ☐ Natural gas
☐ Oil ☐ Other (specify): _____

- c. Is the co-fired fuel fired:

☐ As a standby fuel when MSW supply is inadequate
☐ Routinely
☐ Other (specify): _____

- d. What percent of the total fuel fired is co-fired fuel?

	<u>On a weight basis</u>	<u>On a heat input basis</u>
Annual average	_____	_____
Daily minimum	_____	_____
Daily maximum	_____	_____

e. Is co-fired fuel added to the combustor through a separate feed system from the MSW feed?

_____ Yes _____ No

If yes, how is the co-fired fuel added?

_____ Spreader stoker

_____ Directly on moving grate

_____ Suspension (e.g., pulverized coal or natural gas)

_____ Other (please specify): _____

III. COMBUSTOR DESIGN AND OPERATION INFORMATION

NOTE: You are not required to generate new data. Only supply the data that is readily available to you. Complete Section III for each municipal waste combustor at the facility. If all the combustors are identical, complete one response. If combustors are not identical, please make the appropriate number of copies of Section III before answering.

III.1 Unit number (or numbers, if this response covers multiple units). Number(s) should correspond to those shown on the diagram referenced in I.4.c.: _____

III.2 Combustor Design

- a. Design feed rate of unit (short tons of waste/day): _____
 - b. Minimum operating rate (as percent of design feed rate): _____
 - c. For single stage combustor:
 1. Combustor gas temperature at inlet to first convective section, °F: _____
 2. Combustor gas residence time at or above temperature in III.2.c.1, seconds: _____
 - d. For multiple stage combustor:
 1. Combustor gas temperature at exit of primary chamber, °F: _____
 2. Combustor gas temperature at exit of secondary chamber, °F: _____
 - e. Does the unit have heat recovery? ____ Yes ____ No If yes, what is the design thermal capacity in million Btu/hour: _____ or thousand pounds of steam/hour: _____
 - f. Number of hours combustor(s) operated in 1987: _____
 - g. Tonnage of waste burned in 1987: _____
- III.3
- a. Year of unit startup: _____
 - b. Year of most recent major renovation, if any: _____
 - c. Have any major modifications been made to the combustor since startup? ____ Yes ____ No ____ If yes, please describe on the back side of this page.

- III.4 a. Combustor manufacturer/designer: _____
b. Grate manufacturer/designer: _____
c. Combustion control system manufacturer/designer: _____
d. Waste heat boiler manufacturer/designer, if applicable:

e. Who was responsible for integrating the system components?

- III.5 Enclose current blueprints or scaled drawings of the combustor identifying the following information:
- a. Dimensions of combustion chambers (height, width, and depth).
 - b. Direction of air flow.
 - c. Dimensions of furnace throat.
 - d. Locations of plenums, overfire air ports, and fans.
 - e. Locations of temperature, pressure, and flow sampling points.
 - f. Grate sections and dimensions.

(If drawings are unavailable, please call Mr. Ron Myers at (919) 541-5407.)

III.6 Waste Feed System

- a. _____ Ram _____ Conveyor _____ Spreader _____ Gravity
_____ Other (please specify) _____
- b. Automatic _____ Manual _____ Other (specify) _____
- c. What parameter controls MSW feed rate?
_____ Steam demand _____ Furnace exit temperature
_____ Other, (please specify): _____

III.7 Grate Design

- a. Number of underfire air plenums: _____
- b. Pressure differential at full load between each underfire air plenum and furnace, inches of water:

Plenum 1 _____	Plenum 4 _____
Plenum 2 _____	Plenum 5 _____
Plenum 3 _____	Plenum 6 _____

III.8 Air Distribution

Answer question "a" if your combustor has a single combustion chamber (typical of most field-erected units). Answer question "b" if your combustor has two or more combustion chambers (typically found on modular units).

a. Combustors with a Single Combustion Chamber

1. For typical fuel quality, what is the underfire (i.e., undergrate) air rate as a percent of total air flow to the combustor:

At full load _____

At minimum operating load _____

Do you adjust underfire air for changes in moisture content in the waste fuel? ____ Yes ____ No If yes, please describe adjustments made on the back of this page.

2. For typical fuel quality, what is the percent O_2 in the combustor exhaust gas, dry basis:

At full load _____

At minimum operating load _____

Do you adjust combustor gas O_2 content for changes in moisture content in the waste feed? ____ Yes ____ No If yes, please describe adjustments made on the back of this page.

NOTE:

If detailed drawings are available for questions 3, 4, and 6 below, it is acceptable to provide these drawings in lieu of filling in the blanks we have provided.

3. How many rows of overfire air jets are located in the primary combustor? _____
4. Do the rows of overfire air jets on opposing walls form?
____ Opposed jets ____ Interlaced jets
____ Other (specify) _____
5. For each row of overfire air jets, what is the pressure drop between header and furnace (inches of water)?

OFA Row	Full Load	Minimum Load
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____

6. For each row of overfire air jets, what is the number and diameter of jets and the angle of inclination from horizontal in degrees (use + degrees to represent upward and - to represent downward from horizontal):

OFA Row	No. of Jets	Diameter	Angle of Inclination
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____

b. Combustors with Two or More Combustion Chambers:

1. Flue gas residence time in each chamber, in seconds:

	Design	Average
First chamber	_____	_____
Second chamber	_____	_____
Third chamber	_____	_____

2. For typical fuel quality, what is the percent of total air flow fed to first chamber:

At full load _____

At minimum operating load _____

Do you adjust underfire air for changes in moisture content in the waste feed? ____ Yes ____ No If yes, please describe adjustments made on the back of this page.

3. Supplemental fuel use (e.g., oil or natural gas) in the secondary or tertiary combustion chambers as a percent of total Btu input to the combustor during normal operation (enter zero if no supplemental fuel is used): _____

4. For typical fuel quality, what is the percent O_2 in the combustor exhaust gas, dry basis:

At full load _____

At minimum operating load _____

Do you adjust combustor gas O_2 content for changes in moisture content in the waste feed? Yes ____ No ____
If yes, please describe adjustments made on the back of this page.

III.9 Air Preheat

- a. Does the facility have air preheat? ____ Yes ____ No

If yes, please answer the following questions:

1. Is air preheated by: ____ Hot flue gas ____ Steam
____ Other (please specify): _____

2. Is preheated air used for:

☐ Underfire air to the drying grate only

☐ Underfire air to all grates

☐ Both underfire air and overfire air

☐ Other (please specify): _____

3. When is preheat used?

☐ When firing wet waste only

☐ When firing all wastes

☐ Other mode of operation (please specify): _____

III.10 Auxiliary Burners

a. What type of auxiliary fuel is used?

☐ Gas ☐ Oil ☐ None

☐ Other (please specify): _____

b. What percentage of total furnace load can be carried by auxiliary burners:

For short duration? _____

For long-term continuous operation? _____

c. If furnace is not already equipped with auxiliary burners, describe on the back side of this page any spatial constraints on the outside of the furnace that would limit addition of auxiliary burners.

III.11 Operation

Please provide a copy of the combustor operating log from a typical operating day. The log should show all temperature and other readings routinely collected.

III.12 Combustor Control System

- a. For each of the control parameters listed below, please indicate whether the control system is manual or automatic.

<u>Control Parameter</u>	<u>Control Mode</u>		<u>Not Controlled</u>
	<u>Manual</u>	<u>Automatic</u>	
Steam Production	_____	_____	_____
CO in Flue Gas	_____	_____	_____
O ₂ in Flue Gas	_____	_____	_____
Fuel Burnout on Grate	_____	_____	_____
Furnace Exit Temperature (i.e., gas temperature at superheater or quench reactor <u>inlet</u>)	_____	_____	_____
Combustor Exit Temperature (i.e., gas temperature at economizer or quench reactor <u>outlet</u>)	_____	_____	_____

Other control parameters, (please specify):

- b. For each of the control parameters identified in III.11.a, what steps are taken if operation begins to deviate from the desired set points?

- Steam Production

Set point: _____ Acceptable range: _____

Automatic or manual steps taken to correct deviation:

CO in Flue Gas

Set point: _____ Acceptable range: _____

Automatic or manual steps taken to correct deviation:

O₂ in Flue Gas

Set point: _____ Acceptable range: _____

Automatic or manual steps taken to correct deviation:

Fuel Burnout on Grate

Set point: _____ Acceptable range: _____

Automatic or manual steps taken to correct deviation:

- Furnace Exit Temperature (i.e., flue gas temperature at superheater or quench reactor inlet)

Set point: _____ Acceptable range: _____

Automatic or manual steps taken to correct deviation:

- Combustor Exit Temperature (i.e., flue gas temperature at economizer or quench reactor outlet)

Set point: _____ Acceptable range: _____

Automatic or manual steps taken to correct deviation:

- Other Control Parameters Listed in III.12.a. (please specify): _____

Set point: _____ Acceptable range: _____

Automatic or manual steps taken to correct deviation:

III.13 Soot Removal

- a. What type of convective section soot control system do you have?

_____ Rapping _____ Blowing

_____ Other (please describe): _____

- b. How is the soot blowing system operated?

_____ Fixed time intervals _____ Based on steam production

_____ Other (please specify): _____

- c. Approximate frequency of soot blowing, in hours: _____

- d. Approximate duration of soot blowing, in minutes: _____

III.14 Startup and Shutdown

- a. How many times was the combustor started in 1987? _____

- b. Is auxiliary fuel used during startup? _____ Yes _____ No

Is auxiliary fuel used during shutdown? _____ Yes _____ No

- c. Are there requirements to attain a specific temperature during startup prior to initiating refuse feed? _____ Yes _____ No

If yes, what is that temperature? _____ °F

Where is it measured? _____

- d. Are there requirements to maintain a specific temperature during shutdown until waste is burned off the grate? _____ Yes
_____ No

If yes, what is that temperature? _____ °F

Where is it measured? _____

- e. Please list each scheduled outages planned for 1988 of more than 2 weeks duration.

Reason	Duration (in days)
_____	_____
_____	_____
_____	_____

- f. Please attach a copy of normal startup and shutdown procedures.

IV. AIR POLLUTION CONTROL DEVICES

NOTE: You are not required to generate new data. Only supply the data that is readily available to you. Complete Section IV for each combustor. If the air pollution control systems on several combustors are identical, complete one response indicating the combustor numbers to which it applies. If the air pollution control systems are not identical, please make the appropriate number of copies of Section IV before entering responses.

- IV.1 a. Combustor Unit Number(s) controlled by this system: _____
- b. Identify and number (in ascending order from the combustor outlet to the stack) the components of the air pollution control system (APCS). (For example, if the cyclone were the closest component to the furnace, it would be given a "1", and so on.):
- ____ Cyclone ____ ESP ____ Fabric Filter ____ Venturi Scrubber
- ____ Wet Scrubber ____ Spray Dryer ____ Dry Sorbent Injection
- ____ Quench Tower (for temperature control)
- ____ Other (please specify): _____
- ____ None
- c. Percent of flue gas through APCS: _____
- IV.2 Total duct length from the incinerator outlet to the inlet to existing particulate control devices: _____ feet
- IV.3 Electrostatic Precipitator (ESP)
- If the unit has an ESP, please provide the following information:
- a. Manufacturer: _____
- b. Year installed: _____
- c. Design particulate removal efficiency (as percent of inlet mass loading): _____
- d. Total ESP collection area: _____ square feet
- e. Design flue gas flow rate: _____ acfm
- f. Design flue gas temperature: _____ °F

- g. Maximum flue gas temperature: _____ °F
- h. Minimum flue gas temperature: _____ °F
- i. Design superficial gas velocity, ft/second: _____
- j. Provide a plan view of the ESP (with dimensions) showing each physically separated section and identifying the sections energized by each transformer/rectifier set. Indicate the direction of gas flow.
- k. Number of fields: _____

- | | Field No. | 1 | 2 | 3 | 4 |
|--|-----------|------------|-------|-------|-------|
| l. Secondary voltages per field, kVDC: | _____ | _____ | _____ | _____ | _____ |
| m. Secondary currents per field, mADC: | _____ | _____ | _____ | _____ | _____ |
| n. Are fields electrified in parallel? | _____ | in series? | | _____ | _____ |
| o. Does the ESP have self-leveling spark rate control? | | | | | |
| _____ Yes _____ No | | | | | |
| p. What criteria are used to trigger wire replacement? | | | | | |

q. Typical Flue Gas Characteristics:

Typical operating inlet and outlet particulate matter concentrations and opacity. Please report all concentrations in gr/dscf at 12 percent CO₂.

- | | Inlet | Outlet | Opacity |
|---|-------|--------|---------|
| | _____ | _____ | _____ |
| - Typical operating inlet gas temperature, °F: | _____ | | |
| - Typical operating outlet gas temperature, °F: | _____ | | |
| - Acid dew point of inlet gas, °F: | _____ | | |
| - Percent moisture in inlet gas: | _____ | | |

IV.4 Wet Scrubber

If unit has a scrubber for particulate control only, please provide the following information:

- a. Manufacturer: _____
- b. Year installed: _____
- c. Design particulate removal efficiency (as of percent inlet mass loading): _____
- d. Type: _____ Fixed-throat venturi _____ Variable-throat venturi
_____ Other (please specify): _____
- e. Design flue gas flow rate: _____ acfm
- f. Design flue gas temperature: _____ °F
- g. Liquid to gas ratio, gal/10³ acfm: _____
- h. Mist eliminator type: _____ Chevron _____ Mesh pad _____ Cyclone
_____ Tray type _____ Other, (please specify): _____
- i. Mist eliminator pressure drop, inches water: _____
- j. Scrubber pressure drop, inches water: _____
- k. Typical Flue Gas Characteristics:
 - Typical operating inlet and outlet particulate matter concentrations and opacity. Please report all concentrations in gr/dscf at 12 percent CO₂.

Inlet	Outlet	Opacity
_____	_____	_____
 - Typical operating inlet gas temperature, °F: _____
 - Typical operating outlet gas temperature, °F: _____
 - Acid dew point of inlet gas, °F: _____
 - Percent moisture in inlet gas: _____
 - Percent moisture in outlet gas: _____

IV.5 Fabric Filter

If the unit has a fabric filtration device, provide the following information:

- a. Manufacturer: _____
- b. Year installed: _____
- c. Design particulate removal efficiency (as percent of inlet mass loading): _____
- d. Number of compartments: _____
- e. Number of bags per compartment: _____
- f. Total bag area, square feet: _____
- g. Design flue gas flow rate: _____ acfm
- h. Design flue gas temperature: _____ °F
- i. Maximum operating temperature: _____ °F
- j. Minimum operating temperature: _____ °F
- k. Bag material and coating: _____
- l. Bag cleaning method: ☐ Shake ☐ Reverse air ☐ Pulse jet
- m. Pressure drop across fabric filter, inches water: _____
- n. Typical bag life, months: _____
- o. Typical Flue Gas Characteristics:

- Typical operating inlet and outlet particulate matter concentrations and opacity. Please report all concentrations in gr/dscf at 12 percent CO₂.

Inlet	Outlet	Opacity
_____	_____	_____

- Typical operating inlet gas temperature, °F: _____
- Typical operating outlet gas temperature, °F: _____
- Acid dew point of inlet gas, °F: _____
- Percent moisture in inlet gas: _____

V. EMISSIONS DATA

NOTE: You are not required to generate new data. Only supply the data that is readily available to you. Complete Section V for each combustor. If the emissions data for several combustors are identical, complete one response indicating the combustor numbers to which it applies. If the emissions data are not identical, please make the appropriate number of copies of Section V before entering responses.

V.1 Combustor Unit Number(s) covered: _____

V.2 What are the permitted emission limits for the following pollutants?

<u>Pollutant</u>	<u>No Limit</u>	<u>Limit as Expressed in Permit (Include Unit of Measure)</u>
Particulate	_____	_____
HCl	_____	_____
SO ₂	_____	_____
CO	_____	_____
Pb	_____	_____
As	_____	_____
Cd	_____	_____
Hg	_____	_____
Total Dioxins	_____	_____
Total Furans	_____	_____
2,3,7,8-Tetrachloro- dibenzo-p-dioxin	_____	_____
2,3,7,8-Tetrachloro- dibenzofuran	_____	_____
Other (specify):		
_____	_____	_____
_____	_____	_____

V.3 Does the unit have continuous emission monitors? ☐ Yes ☐ No

If yes, please list the pollutants monitored and indicate the typical range and average concentrations measured. Please show concentration units:

Pollutant	Minimum	Maximum	Average
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

V.4 For pollutants listed in V.2, please attach the most recent summary reports that document results of emission tests conducted at your facility, including those tests performed for purposes of demonstrating compliance with State or local permits or to fulfill contractual requirements for acceptance of equipment.

V.5 Provide the following information on the unit stack:

a. Is the stack: ☐ unique to this combustor or ☐ shared with other units.

If shared, what are the unit numbers of the other combustors:

b. Stack height, ft: _____

c. Diameter, ft: _____

d. Flue gas temperature at stack exit, °F: _____

VI. RESIDUE GENERATION

NOTE: You are not required to generate new data. Only provide the data that is readily available to you.

VI.1 Solid residue streams generated:

___ Bottom ash ___ Fly ash ___ Acid gas control sorbent

___ Other, (specify): _____

VI.2 Are bottom ash and fly ash: ___ Handled separately ___ Combined

VI.3 If a combined ash stream is generated, please indicate where in the system the ash streams join. Please specify "fly ash" or "bottom ash" for "wet" or "dry" below.

1. Bottom ash discharger ___

a. wet _____

b. dry _____

2. Conveyor transfer point ___

a. wet _____

b. dry _____

3. Ash bunker ___

a. wet _____

b. dry _____

4. Transport container ___

a. wet _____

b. dry _____

5. Mixing device, (specify): _____

a. wet _____

b. dry _____

6. Conveyor belt ____

a. wet _____

b. dry _____

7. Other, (please describe): _____

VI 4 How much liquid residue was generated in 1987? Please specify the units of measurement.

Quench water _____ Scrubber sludge _____

Boiler cleaning waste _____ Other (please specify) _____

VI 5 Please provide the following monthly ash data. Please specify the units of measurement (e.g., tons). If exact figures are not available, please estimate and label as estimates. If fly ash and bottom ash are not generated as separate streams, write "0" on the bottom ash and fly ash lines.

	<u>Bottom</u>	<u>Fly</u>	<u>Combined</u>
Jan '87	_____	_____	_____
Feb '87	_____	_____	_____
March '87	_____	_____	_____
April '87	_____	_____	_____
May '87	_____	_____	_____
June '87	_____	_____	_____
July '87	_____	_____	_____
Aug '87	_____	_____	_____
Sept '87	_____	_____	_____
Oct '87	_____	_____	_____
Nov '87	_____	_____	_____
Dec '87	_____	_____	_____

VI.6 Has the ash from your facility ever been tested or analyzed?

_____ Yes _____ No _____ Unknown

VI.7 Does the facility have an established ash sampling and analysis program? _____ Yes _____ No If no, go to VI.8.

a. If yes, how often are ash samples collected (e.g., daily)?

Fly ash _____

Bottom ash _____

Combined _____

b. Where are the ash samples collected (e.g., ESP plenum)?

Fly ash _____

Bottom ash _____

Combined _____

c. Please specify the compositing method used for ash sampling. If not known, please indicate.

d. What time frame does each ash sample represent (e.g., one shift, one day)? _____

e. Who does the sampling (e.g., plant technician, outside consultant)? _____

f. Is there a written sampling quality assurance plan?
_____ Yes _____ No If yes, please attach. If not known, please indicate.

g. What types of ash analysis are conducted?

_____ EP Toxicity _____ TCLP _____ Distilled water

_____ Dioxins/Furans _____ Organics _____ Leaching

_____ Total elemental (metals) analysis

_____ Other (please specify): _____

- VI.8 Are any analytical tests (e.g., EP Toxicity) done on a regular/routine basis? ☐ Yes ☐ No If yes, please provide the following information:

<u>Ash Type</u>	<u>Type of Analysis</u>	<u>Test Frequency</u>
Fly	_____	_____
Bottom	_____	_____
Combined	_____	_____

- VI.8 Please provide the results of all ash chemical analyses (attach copies of lab data sheets if available).

- VI.9 Have the liquid wastes from your facility ever been tested or analyzed? ☐ Yes ☐ No If yes, which liquids were tested? What types of analyses were performed?

- VI.10 What eventually happens to the residue sampling and analysis data?

☐ Submitted to State agency. If so, which agency? _____

☐ Submitted to Federal agency. If so, which agency? _____

☐ Internal use only ☐ Published (public domain)

☐ Other (please specify) _____

VII. RESIDUE HANDLING AND DISPOSAL

NOTE: You are not required to generate new data. Only supply the data that is readily available to you.

VII.1 Describe in detail the facility systems for collection and transfer of ash at your facility. Please indicate the types of ash handled by each component. Attach a schematic if available.

VII.2 Is ash stored on-site prior to disposal? ☐ Yes ☐ No

a. If yes: What types of ash are stored?

☐ Combined ☐ Fly ash ☐ Bottom ash

What is the capacity of the storage area?

What is the average quantity of ash in storage?

VII.3 Describe any and all containment measures in the ash handling/storage areas for the following:

a. Runoff (i.e., any type of surface water drainage or discharge from the ash handling and storage areas)

b. Fugitive dust emissions:

VII.4 How is the ash transported to the disposal site (e.g., truck or trains)?

VII.5 How many miles is the disposal site from your facility? _____

VII.6 What precautions are taken to minimize fugitive dust emission during transport activities? _____

VII.7 Is the ash from your facility treated prior to its disposal?
_____ Yes _____ No

(Treatment is defined as the addition of chemical substances or processes that affect the physical and/or chemical nature of the ash.)

If yes: What type of treatment is used (e.g., neutralization, stabilization)? _____

What types of ash are treated? _____

Describe the actual treatment process: _____

VII.8 Describe any treatment methods used for the liquids or sludges at your facility prior to their disposal. Identify the liquid type. Please include a description of quench water fate. _____

VII.9 Where is the ash generated at your facility taken for disposal?

_____ Municipal solid waste (i.e., sanitary) landfill

_____ Industrial solid waste landfill

_____ On-site ash landfill ('monofill')

_____ Off-site ash landfill ('monofill')

_____ Surface impoundment (_____ On-site _____ Off-site)

_____ Stockpiles (_____ On-site _____ Off-site)

_____ Other (please describe) _____

VII.10 Describe any recycling or reuse of the ash that occurs in lieu of or in addition to land disposal (e.g., used as aggregate in asphalt paving or as landfill cover material). _____

VII.11 What is the percentage of the total ash produced that is recycled or reused? _____

VII.12 Where are the liquids and/or sludges disposed of? _____

VII.13 To the maximum extent possible, please provide the following specifications data for each land disposal site that has accepted ash from your facility: (Make additional copies as necessary).

a. Location: _____

b. Name and phone number of facility contact: _____

If you do not have the requested detailed information, please provide answers to "a" and "b" above. We are not requesting that you provide information which is currently not in your possession

How long have you been sending your ash to this facility? _____

Other wastes disposed of at site (if known): _____

Dimensions: Overall _____

Active cell _____

How long has the active cell been receiving ash and other wastes? _____

Is the ash mixed with the trash or placed in segregated portion of the site? (please describe) _____

What types of protective devices are used at the site:

_____ Liner (_____ Clay _____ Synthetic _____ Composite)

_____ Leachate collection system (please describe leachate collection system)

☐ Run-on and run-off controls (i.e., berms, levees, graded slopes) (please indicate what types).

☐ Daily and final cover (please describe what types of cover materials are used)

☐ Dust control (please describe).

What types of environmental monitoring systems are in use?

☐ Ground water monitoring wells

☐ Air monitoring

Are there any expansion plans for the land disposal site currently being utilized? ☐ Yes ☐ No

If yes, can you provide any design specs similar to the items requested above? _____

VII.14 Please provide any available environmental monitoring data from the land disposal site for the following media (attach lab data sheets, tables or other documentation as necessary):

Ground water

Surface water

Leachate (if site has leachate collection system)

Air

VIII. REVENUES, COSTS, AND OTHER ECONOMIC INFORMATION

NOTE: You are not required to generate new data. Only supply the data that is readily available to you.

This information will be used by EPA to assess the economic impact of possible new environmental regulations on MWC facilities.

What type of information is needed?

The questionnaire requests the following data from the MWC facility that you own or operate.

- o Capital and operating cost data.
- o Data on revenues derived from the sale of facility services or payments provided to support continued provision of waste disposal services.
- o Information on financing and contractual arrangements covering waste combustion and by-products.

If you have more than one combustor unit at your facility, make additional blank copies of Part VIII to be filled out for each unit. However, fill out only one copy of Part VIII if the facility has combustors that are of the same type and operated for all intents and purposes as a single unit. For example, if two modular combustors with energy recovery capability share a waste stream and emission control systems, treat them as a single unit.

Who should answer the questions?

This information request has been sent to plant managers. However, some of the questions on economics or finance may be inappropriate for plant managers or operating personnel to answer. If that is the case, please direct such questions to the appropriate financial or budgetary staff.

How should I use the Notes and Comments page at the end of Part VIII?

If there are special circumstances for your facility that affect a particular question or your interpretation of a particular question, please bring these to our attention by using the Notes and Comments page at the end of Part VIII.

VIII.1 What number was assigned to this combustor unit in Question III.1?

Unit Number: _____

COSTS

Question VIII.2 through VIII.10 concern costs related to the planning, installation, operation, and anticipated decommissioning of each of the units. Organizations frequently have different ways of allocating costs and keeping cost records. Try to match your account categories to the typical

cost categories given for each question. Note substantive differences in the margin next to our cost categories. If one of your account categories does not appear in the question, indicate the value of that category under "other" costs.

VIII.2 What was the initial investment in this unit?

(Initial investment includes the initial expenditures required to begin unit operation, in the areas of planning, engineering and design, equipment purchase and installation, testing, interest payments during construction, and worker training for each combustor unit as of the date that operation began. Any investments that occurred after the unit became operational are considered subsequent investments, and should be noted in Question VIII.3)

Category	Cost (\$1000)	Accuracy (circle)	Investment Period (month/year)
a. Planning and management (including staffing and training, appli- cations and approval)	_____	actual or estimate	___/___ to ___/___
b. Site acquisition	_____	actual or estimate	___/___ to ___/___
c. Detailed design and engineering	_____	actual or estimate	___/___ to ___/___
d. Equipment purchase, installation and testing			
1. Combustor equip- ment	_____	actual or estimate	___/___ to ___/___
2. Air pollution control equipment	_____	actual or estimate	___/___ to ___/___
3. Balance of plant	_____	actual or estimate	___/___ to ___/___
e. Interest payments during construction	_____	actual or estimate	___/___ to ___/___
f. Other initial invest- ment costs (specify)			
_____	_____	actual or estimate	___/___ to ___/___
_____	_____	actual or estimate	___/___ to ___/___
g. Total investment	_____		

VIII.3 --What subsequent investments have been made to this unit?

(Subsequent investments include the expenditures required to upgrade unit operation, in the areas of planning, engineering and design, equipment purchase and installation, testing, and interest payments for construction of modifications. Any expenditures that occurred before the unit became operational are considered initial investments, and should be noted in Question VIII.2)

Category	Cost (\$1000)	Accuracy (circle)	Investment Period (month/year)
a. Improvements to combustor (describe each modification on the back of this page)	i. _____	actual or estimate	___/___ to ___/___
	ii. _____	actual or estimate	___/___ to ___/___
	iii. _____	actual or estimate	___/___ to ___/___
b. Improvements to air pollution control equipment (describe each modification on the back of this page)	i. _____	actual or estimate	___/___ to ___/___
	ii. _____	actual or estimate	___/___ to ___/___
	iii. _____	actual or estimate	___/___ to ___/___
c. Improvements to by-product production (recycled materials, steam, electricity, etc.) (describe each modification on the back of this page)	i. _____	actual or estimate	___/___ to ___/___
	ii. _____	actual or estimate	___/___ to ___/___
	iii. _____	actual or estimate	___/___ to ___/___
d. Improvements to balance of plant (describe each modification on the back of this page)	i. _____	actual or estimate	___/___ to ___/___
	ii. _____	actual or estimate	___/___ to ___/___
	iii. _____	actual or estimate	___/___ to ___/___
e. Total subsequent investment	_____	actual or estimate	___/___ to ___/___

VIII.4 Approximately what year do you expect this unit to be decommissioned?

Expected year of decommissioning: _____

VIII.5 What is the expected cost of decommissioning, less any site and salvage value?

Expected cost of decommissioning: _____

VIII.6 What periodic investments, occurring in multiyear intervals, and including equipment replacement, do you expect the unit to need in the future?

Category	Cost (\$1000)	Accuracy (circle)	Investment Frequency (No. of years)
a. Refuse handling	_____	actual or estimate	_____
b. Combustor	_____	actual or estimate	_____
c. Air pollution control equipment	_____	actual or estimate	_____
d. Energy production	_____	actual or estimate	_____
g. Other (specify)			
_____	_____	actual or estimate	_____
_____	_____	actual or estimate	_____

VIII.7 What are the ownership and operation arrangements for this unit?
(More than one YES answer may be checked for joint public and private ownership or operation)

- a. Publicly owned ☐ Yes ☐ No
- b. Publicly operated ☐ Yes ☐ No
- c. Privately owned ☐ Yes ☐ No
- d. Privately operated ☐ Yes ☐ No

VIII.8 - What are the current annual operating costs of this unit?
 (Include costs that occur during the course of each year. If some
 of these costs cover more than one unit, estimate the proportion
 of these costs that apply to this particular unit.)

Category	Cost Per Year (\$1000)	Accuracy (circle)
a. Operating and maintenance materials and labor. Include utilities, supplemental fuel, and labor costs fully loaded with benefits, unemployment insurance, etc.		
i. Combustor	_____	actual or estimate
ii. Air pollution control equipment	_____	actual or estimate
iii. Balance of plant	_____	actual or estimate
e. Residue disposal services	_____	actual or estimate
f. Insurance	_____	actual or estimate
g. Administration and management	_____	actual or estimate
h. Taxes (including licenses and permit fees)	_____	actual or estimate
i. Debt service	_____	actual or estimate
j. Other (specify)	_____	actual or estimate
_____	_____	actual or estimate
k. Total annual operating costs	_____	actual or estimate

VIII.12 What is currently charged by this unit for waste disposal services?
 (If a published tipping or fee schedule for waste disposal at your facility is available, please attach it to this questionnaire.)

Category	Price (dollars/unit of measure)	Units of Measure	
		tons	cubic feet
a. Preferred municipal solid waste (MSW) under contract	_____	_____	_____
b. Other MSW under contract	_____	_____	_____
c. Noncontract MSW	_____	_____	_____
d. Noncontract commercial and industrial waste	_____	_____	_____

FINANCE AND CONTRACTS

Questions VIII.13 through VIII.15 concern the amount and method used to finance the MSW combustion unit and the contractual provisions which cover unit's operation. These questions help provide a basis for determining financial and contractual arrangements may affect, and be affected by, environmental regulations.

What if I operate more than one unit covered by the same financial or contractual arrangements?

Answer this section once and reference these answers in the questionnaire covering the other units.

VIII.13- How is the financing of this unit structured? If sale and lease-back provisions were used to finance this facility, this question refers to financing as structured by the current owner.

Category	Initial Amount	Average Debt Term
a. Taxable bonds	\$ _____	_____ years
b. Tax-exempt bonds	\$ _____	_____ years
c. Private equity	\$ _____	
d. Public capital improvement funds	\$ _____	
e. Grants or transfers	\$ _____	
f. Other (specify)	\$ _____	

VIII.14 Contracts often contain specific provisions for pricing and delivery of waste disposal services. Do the contracts covering operation of this unit contain important provisions specifying:

- a. An index used to price future combustion services? _____ Yes _____ No
- b. Minimum delivery required of waste producers? _____ Yes _____ No
- c. Maximum delivery accepted from waste producers? _____ Yes _____ No
- d. Minimum waste accepted by combustor operator? _____ Yes _____ No
- e. Restrictions on the composition of waste delivered? _____ Yes _____ No
- f. Terms of the contract? _____ Yes _____ No
- g. Disposal of ash? _____ Yes _____ No
- h. Disposal of non-combusted feed waste? _____ Yes _____ No

VIII.9 - What would be the cost if, in order to install pollution control equipment, one of the following situations occurred? (In this question, cost refers to any lost revenues, penalties, fixed costs or other payments which have to be made.)

Category	Cost (\$1000)	Accuracy (circle)
a. Operate half time for 3 mos.	_____	actual or estimate
b. Cease operating for 1 mo.	_____	actual or estimate
c. Cease operating for 3 mos.	_____	actual or estimate
d. Cease operating for 6 mos.	_____	actual or estimate

VIII.10 How many employees are engaged in the operation of this incineration facility? (Report the number of full-time employees; if two individuals each work half-time, count them as one full-time employee. If an employee's time is spread across more than one category below, report the fraction of time worked in each category so that the fractions add up to 1 if full time, .5 if half time, etc.)

Category	Number of Employees
a. Management	_____
b. Administrative	_____
c. Clerical	_____
d. Planning	_____
e. Operations	_____
f. Other	_____

REVENUES

Answers to Questions VIII.11 and VIII.12 will be used to estimate the economic impact of municipal waste combustion facilities on different sectors of the economy. These questions concern all revenues derived from operating subsidies and the sale of refuse disposal services, recycled materials, steam, and electricity. Organizations frequently have different ways of allocating revenues and keeping revenue records. Try to match your account categories to the typical revenue categories given for each question. Note substantive differences in the margin next to our revenue categories. If one of your account categories does not appear in the question, indicate the value under "other revenues."

VIII.11 What are the current annual operating revenues of this unit?

Category	Revenues per year (\$1000)	Accuracy (circle)	Amount Sold (specify units)
a. Sale of refuse disposal services	_____	actual or estimate	_____ 100 tons ³ or 100 ft ³
b. Sale of recycled materials	_____	actual or estimate	_____ 100 tons ³ or 100 ft ³
c. Sale of steam	_____	actual or estimate	_____ million Btu
d. Sale of electricity	_____	actual or estimate	_____ thousand kWh
e. Other revenues (specify sources)	_____	actual or estimate	
Sources: _____			
f. Operating subsidies (specify form and sources)	_____	actual or estimate	
Subsidy form and sources: _____			

VIII.15 What are the provisions covering sale of by-products of municipal waste combustion? (Check YES or NO for each provision.)

Category	Spot Market		Take or Pay		Contracted Minimum Amount		Contracted Maximum Amount	
	YES	NO	YES	NO	YES	NO	YES	NO
a. Recycled material	—	—	—	—	—	—	—	—
b. Electricity	—	—	—	—	—	—	—	—
c. Steam	—	—	—	—	—	—	—	—

VIII.16 Provide the name, mailing address, and telephone number of the individual who answered, or coordinated the answers, to questions in Part VIII if different from coordinator identified in Section I.

a. Name:

b. Address:

c. Telephone number:

() _____

PART VIII.17

NOTES AND COMMENTS

IX. SUGGESTIONS FOR FUTURE QUESTIONNAIRES

NOTE: To make regulatory decisions based on the best available data and science, the EPA frequently relies on the use of questionnaires to collect information. In an effort to improve future questionnaires in terms of clarity of instructions and ease of completion, please answer the questions below and provide additional comments or suggestions you may have towards improving future questionnaires.

IX.1 Were the instructions to this questionnaire clear? ☐ Yes
☐ No If no, which instructions were the most confusing?

IX.2 Was the questionnaire adequately targeted for the level of understanding of the respondent? ☐ Yes ☐ No

IX.3 Was the organization of the questionnaire logical? ☐ Yes
☐ No If no, can you suggest a more logical format?

IX.4 Did the format of the questionnaire leave adequate space for the responses? ☐ Yes ☐ No

IX.5 We used several different designs for the questions. Did we design the questions in an appropriate style for the intended responses? (i.e., essay or descriptive vs. multiple choice) ☐ Yes ☐ No

IX.6 Can you offer any further suggestions for improving this questionnaire? ☐ Yes ☐ No If yes, please describe your suggestions.

APPENDIX D

SURVEY QUESTIONNAIRE RESPONSE RATES

RESPONSE RATES FOR MWC SURVEY QUESTIONS

<u>QUESTION</u>	<u>RESPONSE RATE (%)</u>	<u>QUESTION</u>	<u>RESPONSE RATE (%)</u>
I.1a	100	II.2 (ind-range)	30-30
I.1b (State)	100	II.2 (other-avg)	67
I.1b (zip code)	100	II.2 (other-range)	22-22
I.1c (latitude)	46	II.3	99
I.1f (phone no.)	99	II.3a (newspaper)	54
I.1f (State)	99	II.3b	38
I.1f (zip code)	98	II.3c (newspaper)	10
I.2a	98	II.3c (bottles)	10
I.2b	98	II.3c (alum.can)	13
I.2c	98	II.3c (other)	14
I.3a	98	II.4a (paper/cardbd)	93
I.3b	98	II.4a (glass)	98
I.4a	98	II.4b (shredding)	91
I.5b (msw-psw)	84	II.5a	90
I.5b (msw-dfy)	81	II.5b	98
I.5b (msw-afy)	79	II.6a	99
I.5b (co-psw)	85	II.6b (min)	9
I.5b (co-dfy)	82	II.6b (max)	11
I.5b (co-afy)	79	II.6c	9
I.5b (apcd-psw)	84	II.6d	5
I.5b (apcd-dfy)	79	II.6e	11
I.5b (apcd-afy)	76	II.6f	12
I.5b (rh-psw)	84	II.7a	12
I.5b (rh-dfy)	80	II.7b	30
I.5b (rh-psw)	78	II.7c	30
I.5b (other-psw)	79	II.7d (avg-wt)	14
I.5b (other-dfy)	77	II.7d (avg-ht)	12
I.5b (other-afy)	76	II.7d (dmnm-wt)	10
I.5c	96	II.7d (dmxm-wt)	10
II.1 (Jan)	81	II.7d (dmnm-ht)	10
II.1 (Feb)	81	II.7d (dmxm-wt)	10
II.1 (Mar)	81	II.7e	39
II.1 (Apr)	81	II.7e (spr-stkr)	22
II.1 (May)	84	VI.1	94
II.1 (Jun)	87	VI.2	87
II.1 (Jul)	87	VI.3.1	70
II.1 (Aug)	88	VI.3.2	61
II.1 (Sept)	88	VI.3.3	49
II.1 (Oct)	90	VI.3.4	59
II.1 (Nov)	93	VI.3.5	46
II.1 (Dec)	93	VI.3.6	50
II.2 (res-avg)	81	VI.4 (quench water)	29
II.2 (res-range)	33-32	VI.4 (boiler waste)	24
II.2 (comm-avg)	80	VI.4 (scrubber sludge)	24
II.2 (comm-range)	31-31	VI.4 (other)	16
II.2 (ind-avg)	77	VI.5 (Jan. 87-bottom)	19

<u>QUESTION</u>	<u>RESPONSE RATE (%)</u>	<u>QUESTION</u>	<u>RESPONSE RATE (%)</u>
VI.5 (Feb 87-bottom)	19	VI.7g	90
VI.5 (Mar 87-bottom)	19	VI.7h	90
VI.5 (Apr 87-bottom)	20	VI.7h (fly an.)	79
VI.5 (May 87-bottom)	19	VI.7h (fly test fr.)	77
VI.5 (Jun 87-bottom)	20	VI.7h (bottom an.)	78
VI.5 (Jul 87-bottom)	19	VI.7h (bottom test fr.)	75
VI.5 (Aug 87-bottom)	19	VI.7h (comb. an.)	84
VI.5 (Sept 87-bottom)	19	VI.7h (comb. test fr.)	84
VI.5 (Oct 87-bottom)	19	VI.9	84
VI.5 (Nov 87-bottom)	19	VI.9 (types anal.)	42
VI.5 (Dec 87-bottom)	21	VI.10	85
VI.5 (Jan 87-fly)	11	VII.1	*
VI.5 (Feb 87-fly)	11	VII.2	97
VI.5 (Mar 87-fly)	11	VII.2a (type ash)	87
VI.5 (Apr 87-fly)	11	VII.2a (capacity)	16
VI.5 (May 87-fly)	11	VII.2a (avg. quantity)	20
VI.5 (Jun 87-fly)	11	VII.3a	82
VI.5 (Jul 87-fly)	10	VII.3b	72
VI.5 (Aug 87-fly)	10	VII.4	96
VI.5 (Sept 87-fly)	10	VII.5	83
VI.5 (Oct 87-fly)	10	VII.6	94
VI.5 (Nov 87-fly)	10	VII.7	98
VI.5 (Dec 87-fly)	12	VII.7 (treatment)	95
VI.5 (Jan 87-comb)	46	VII.7 (type ash)	97
VI.5 (Feb 87-comb)	46	VII.7 (description)	88
VI.5 (Mar 87-comb)	46	VII.8	*
VI.5 (Apr 87-comb)	48	VII.9	97
VI.5 (May 87-comb)	50	VII.10	89
VI.5 (Jun 87-comb)	50	VII.11	87
VI.5 (Jul 87-comb)	50	VII.12	50
VI.5 (Aug 87-comb)	52	VII.13b	76
VI.5 (Sept 87-comb)	54	VII.13b (sending ash)	78
VI.5 (Oct 87-comb)	54	VII.13b (other wastes)	65
VI.5 (Nov 87-comb)	57	VII.13b (overall dimen.)	38
VI.5 (Dec 87-comb)	59	VII.13b (active cell dim.)	29
VI.6	96	VII.13b (mixed or not)	64
VI.7a (fly)	71	VII.13b (liner)	42
VI.7a (bottom)	73	VII.13b (lcs)	48
VI.7a (comb)	88	VII.13b (run-on cont.)	47
VI.7b (fly)	74	VII.13b (daily cover)	60
VI.7b (bottom)	75	VII.13b (dust control)	*
VI.7b (comb)	87	VII.13b (gw monitoring)	51
VI.7c	88	VII.13b (expansion)	59
VI.7d	88		
VI.7e	88		
VI.7f	90		

* - Rate not calculated due to lack of response

APPENDIX E

CODING MANUAL

E-1

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

<u>SURVEY QUESTION NUMBER</u>	<u>VARIABLE NAME</u>	<u>VARIABLE LABEL</u>	<u>VARIABLE LENGTH</u>	<u>CODING</u>
I. 1a	NAME	Name of facility	3	Survey #
I. 1b	STATE	State	2	Alphabetical list # 1-57
I. 1b	ZIP	Zip code	5	Actual
I. 1c	LAT	Latitude	6	Actual
I. 1c	LONG	Longitude	6	Actual
I. 1f	PHONE	Phone number	10	Actual
I. 1f	MSTATE	Mailing state	2	Actual
I. 1f	MZIP	Mailing zip code	5	Actual
I. 2a	FEMGS	Field erected, moving grate stoker	1	# combustor units
	RC	Rotary combustor	1	# combustor units
	MSA	Modular, starved air	1	# combustor units
	MES	Modular, excess air	1	# combustor units
	OMB	Other, mass burn	1	# combustor units
I. 2b	SST	RDF - spreader stoker	1	# combustor units
	ORDF	RDF - other	1	# combustor units
I. 2c	COAL	Co-fired - coal	1	# combustor units
	SEW	Co-fired - sewage sludge	1	# combustor units
	WOOD	Co-fired - wood chips	1	# combustor units
	OCF	Co fired other	1	# combustor units
I. 3a	HRS	# hours/day operating	2	Actual hours

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

<u>SURVEY QUESTION NUMBER</u>	<u>VARIABLE NAME</u>	<u>VARIABLE LABEL</u>	<u>VARIABLE LENGTH</u>	<u>CODING</u>
I. 3b	DAYS	# days/week operating	1	Actual hours
I. 4a	LANDUSE	Surrounding land use	5	1 = Industrial 2 = Commercial 3 = Residential 4 = Rural 5 = Other
I. 5a	OPTRAIN	Is operator training required	1	1 = Yes 2 = No
	AGENCIES	If yes, name agencies	1	1 = State agency 2 = Other agency 3 = N/A
<u>Formal training hours</u>				
I. 5b	MSWPSW	MSW handling - prior to work	3	Actual hours
	MSWDFY	MSW during 1st year of employment	3	Actual hours
	MSWAFY	MSW after 1st year of employment	3	Actual hours
	COPSW	Combustor operation - prior to work	3	Actual hours
	COOIFY	CO during 1st year of employment	3	Actual hours
	COAFY	CO after 1st year of employment	3	Actual hours

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

<u>SURVEY QUESTION NUMBER</u>	<u>VARIABLE NAME</u>	<u>VARIABLE LABEL</u>	<u>VARIABLE LENGTH</u>	<u>CODING</u>
I. 5c	APCPSW	Air pollution control - prior to work	3	Actual hours
	APCDFY	APC during 1st year of employment	3	Actual hours
	APCAFY	APC after 1st year of employment	3	Actual hours
	RHPSW	Residue handling - prior to work	3	Actual hours
	RHDFY	RH during 1st year of employment	3	Actual hours
	RHAFY	RH after 1st year of employment	3	Actual hours
	OPSW	Other training prior to work	3	Actual hours
	ODFY	Other training during 1st year of employment	3	Actual hours
	OAFY	Other training after 1st year of employment	3	Actual hours
	TRAINERS	Who conducts training	4	1 = In house 2 = Private contractor 3 = State/local agency 4 = Other 5 = None / N/A
				Actual tons
II. 1	JANT thru DECT	1987 monthly waste tonnage	5	

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

<u>SURVEY QUESTION NUMBER</u>	<u>VARIABLE NAME</u>	<u>VARIABLE LABEL</u>	<u>VARIABLE LENGTH</u>	<u>CODING</u>
II. 2		<u>Waste % breakdown by type</u>		
	RESA	Residential - average	3	Actual %
	COMA	Commercial - average	3	Actual %
	INDA	Industrial - average	3	Actual %
	OTHA	Other - average	3	Actual %
	RESLO	Residential - low	2	Actual %
	COMLO	Commercial - low	2	Actual %
	INDLO	Industrial - low	2	Actual %
	OTILO	Other - low	2	Actual %
	RESHI	Residential - high	3	Actual %
	COMHI	Commercial - high	3	Actual %
	INDHI	Industrial - high	3	Actual %
	OTHI	Other - high	3	Actual %
II. 3	MUNR	Municipal recycling program	1	1 = Yes 2 = No 3 = Unknown
II. 3a	RCYC	If yes, what is recycled	4	1 = Newspapers 2 = Bottles 3 = Aluminum cans 4 = Other
II. 3b	RESR	% residential waste collected	3	Actual %
II. 3c	NEWE	Proportion newspapers recycled		Actual %
	BOTE	Proportion bottles recycled		Actual %
	ALUE	Proportion aluminum recycled		Actual %
	OTIE	Proportion other material recycled		Actual %

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

SURVEY QUESTION NUMBER	VARIABLE NAME	VARIABLE LABEL	VARIABLE LENGTH	CODING
II. 4a	COM	Types of combustibles removed	4	0 = None 1 = Paper/card board 2 = Plastics 3 = Bulky/oversize waste 4 = Other
II. 4b	NCOM	Types of noncombustibles removed	5	0 = None 1 = Glass 2 = Metals 3 = Batteries 4 = Bulky/oversize waste 5 = Other
II. 4c	PROC	Additional processing	4	0 = None 1 = Shredding 2 = Baling 3 = Pelletizing 4 = Other
II. 4d	WAST	% waste segregated/ disposed	3	Actual %
II. 5a	WFSC	Waste storage area	4	Actual Tons
II. 5b	WDGAR	Wet and dry garbage separated	1	1 = Yes 2 = No
II. 6a	FRDF	Fire refuse derived fuel	1	1 = Yes 2 = No

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

SURVEY QUESTION NUMBER	VARIABLE NAME	VARIABLE LABEL	VARIABLE LENGTH	CODING
II. 6b	RDFMAX	Max. size of as-fired RDF (in.)	2	Actual inches
	RDFMIN	Min. size of as-fired RDF (in.)	2	Actual inches
II. 6c	MSWGON	% of total MSW removed during process	3	Actual %
II. 6d	HEATGON	% of total heat content of MSW removed	3	Actual %
II. 6e	RDFASH	What is % ash content of RDF	3	Actual %
II. 6f	HEATVAL	Average heating value of RDF	4	Actual BTU/Lb
II. 7a	MSWCOF	MSW co-fired with another fuel	1	1 = Yes 2 = No 3 = N/A
II. 7b	FUEL	Type of fuel co-fired	6	1 = Wood 2 = Coal 3 = Sewage sludge 4 = Natural gas 5 = Oil 6 = Other
II. 7c	FIRE	Firing of co-fired fuel	1	1 = As a standby fuel 2 = Routinely 3 = Other 4 = N/A

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

SURVEY QUESTION NUMBER	VARIABLE NAME	VARIABLE LABEL	VARIABLE LENGTH	CODING
II. 7d		% total fuel is co-fired fuel		
	AAWB	Annual average - weight basis	2	Actual %
	DMNWB	Daily minimum - weight basis	2	Actual %
	DMXWB	Daily maximum - weight basis	2	Actual %
	AAHIB	Annual average - heat input basis	2	Actual %
	DMNHIB	Daily minimum - heat input basis	2	Actual %
	DMXHIB	Daily maximum - heat input basis	2	Actual %
II. 7e	FEED	Separate feed system for co-fired fuel	1	1 = Yes 2 = No
	CFADD	How is co-fired fuel added	4	1 = Spreader stoker 2 = Directly on moving grate 3 = Suspension (pulverized coal) 4 = Other 5 = N/A
VI. 1	SOLIDRES	Solid waste streams generated	4	1 = Bottom ash 2 = Fly ash 3 = Acid gas control sorbant 4 = Other 5 = All of the above

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

<u>SURVEY QUESTION NUMBER</u>	<u>VARIABLE NAME</u>	<u>VARIABLE LABEL</u>	<u>VARIABLE LENGTH</u>	<u>CODING</u>
VI. 2	COMBINED	Are bottom and fly ash combined	1	1 = Handled separately 2 = Combined
VI. 3		<u>Where in systems do ash streams join</u>		
	BAD	Bottom ash discharger	1	1 = Wet
	CTP	Conveyor transfer point	1	2 = Dry
	AB	Ash bunker	1	3 = N/A
	TC	Transport container	1	4 = Both wet and dry
	MD	Mixing device	1	
	CB	Conveyor belt	1	
VI. 4		<u>1987 liquid residue generation</u>		
	QUENCH	Quench water	6	1000s of gallons
	SCRUB	Scrubber sludge	6	1000s of gallons
	BOILER	Boiler cleaning waste	6	1000s of gallons
	OUJQ	Other liquid	6	1000s of gallons
VI. 5	JANBTM - DECBTM	1987 monthly bottom ash data	4	Actual tons
	JANFLY - DECFLY	1987 monthly fly ash data	4	Actual tons
	JANCOM - DECOM	1987 monthly combined	4	Actual tons

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

SURVEY QUESTION NUMBER	VARIABLE NAME	VARIABLE LABEL	VARIABLE LENGTH	CODING
VI. 6	ASHTEST	Has ash ever been tested	1	1 = Yes 2 = No 3 = Unknown
VI. 7	ASHPROG	Have any ash sampling program	1	1 = Yes 2 = No
VI. 7a	OFTENFLY	How often samples collected - fly	1	1 = 3 times/day 2 = Daily
	OFTENBOT	How often samples collected - bottom	1	3 = Monthly 4 = Quarterly
	OFTENCOM	How often samples collected - combined	1	5 = Twice/year 6 = Once/year 7 = Collected upon request 8 = Other 9 = N/A
VI. 7b	WHEREFLY	Where are samples collected - fly	1	1 = Conveyor 2 = Truck
	WHEREBOT	Where are samples collected - bottom	1	3 = Ash container/discharger 4 = Other
	WHERECOM	Where are samples collected - combined	1	5 = N/A
VI. 7c	COMPMETH	Ash sampling compositing method	1	1 = Grab sample 2 = Other 3 = N/A 4 = None

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

SURVEY QUESTION NUMBER	VARIABLE NAME	VARIABLE LABEL	VARIABLE LENGTH	CODING
VI. 7d	TIMEFR	Ash sample time frame	1	1 = One shift (or 8 hours) 2 = One day / 3 = random 3 = Random 4 = Other 5 = N/A
VI. 7e	SAMPLER	Who does the sampling	1	1 = Plant technician 2 = Outside consultant 3 = N/A 4 = Other
VI. 7f	QAPLAN	Is there a written sampling QA plan	1	1 = Yes 2 = No 3 = N/A
VI. 7g	ANALYSIS	Types of ash analyses conducted	2	0 = N/A 1 = EP toxicity 2 = TCLP 3 = Distilled water 4 = Dioxins/furans 5 = Organics 6 = Leaching 7 = Total elemental (metals) analysis 8 = Other 9 = 1+2 10 = 1+3 11 = 1+4

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

SURVEY QUESTION NUMBER	VARIABLE NAME	VARIABLE LABEL	VARIABLE LENGTH	CODING
VI. 7h	ROUTINE	Any routine analytical tests	1	12 = 1+5
				13 = 1+6
				14 = 1+7
				15 = 1+8
				16 = Three or more analyses conducted
				1 = Yes
				2 = No
				3 = Unknown
				4 = N/A
	FLYTYPE FLYFREQ BOTTYPE BOTEFREQ COMTYPE COMFREQ	Analysis type - fly Analysis frequency - fly Analysis type - bottom Analysis frequency - bottom Analysis type - combined Analysis frequency - combined	1	Same as VI. 7g above # per year ("x"/yr)
				Same as VI. 7g above # per year ("x"/yr)
				Same as VI. 7g above # per year ("x"/yr)
				Same as VI. 7g above # per year ("x"/yr)
				Same as VI. 7g above # per year ("x"/yr)
VI. 9	LIQTEST	Liquid wastes ever been tested	1	1 = Yes
				2 = No
				3 = Unknown
VI. 10	LIQTYPE	Types of analyses performed	1	*
	AGENCY	What happened to sampling data	2	1 = State agency 2 = Federal agency 3 = Internal use only 4 = Published (public domain) 5 = Other 6 = N/A/unknown

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

<u>SURVEY QUESTION NUMBER</u>	<u>VARIABLE NAME</u>	<u>VARIABLE LABEL</u>	<u>VARIABLE LENGTH</u>	<u>CODING</u>
VII. 1	COLTRAN	Systems for collection/ transfer	2	*
VII. 2	STORAGE	Is ash stored on-site	1	1 = Yes 2 = No
VII. 2a	ASHTYPE	Types of stored ash	3	1 = Combined 2 = Fly ash 3 = Bottom ash 4 = N/A 5 = Fly and bottom ash stored separately
	CAPACITY AVERAGE	Capacity of storage area Average quantity in storage	4 4	Actual tons Actual tons
VII. 3a	RUNOFF	Runoff containment measures	1	0 = None 1 = Sanitary sewer 2 = Drainage and/or recirculation 3 = Ash in pit /gravity settling 4 = Wastewater treatment system 5 = Storage tank/area 6 = Other 7 = N/A/unknown

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

<u>SURVEY QUESTION NUMBER</u>	<u>VARIABLE NAME</u>	<u>VARIABLE LABEL</u>	<u>VARIABLE LENGTH</u>	<u>CODING</u>
VII. 3b	FUGDUST	Fugitive dust containment measures	1	0 = None 1 = Ash is wet/conditioned 2 = Covered/wetted conveyors 3 = Ash recirculated/captured 4 = Other 5 = N/A/unknown
VII. 4	TRANSPOR	How ash transported to disposal site	1	1 = Truck 2 = Train
VII. 5	MILES	Miles bwn facility and disposal site	3	Actual miles
VII. 6	PRECAUT	Dust emission precautions	2	0 = None 1 = Ash is wet 2 = Truck tarped/covered 3 = Other 4 = N/A/unknown
VII. 7	TREAT	Ash treated prior to disposal	1	1 = Yes/2 = No
	TRMETHOD	Treatment methods used	2	1 = Neutralization 2 = Stabilization 3 = N/A 4 = Other
	ASHTYPE2	Types of ash treated	1	1 = Combined 2 = Fly ash 3 = Bottom ash 4 = N/A
	TRPROCESS	Ash treatment process	2	

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

<u>SURVEY QUESTION NUMBER</u>	<u>VARIABLE NAME</u>	<u>VARIABLE LABEL</u>	<u>VARIABLE LENGTH</u>	<u>CODING</u>
VII. 8	LQSLUD	Liquid/sludge treatment methods	2	*
VII. 9	DISPOSAL	Ash disposal location	2	1 = MSW LF 2 = Industrial SW LF 3 = On-site ash LF 4 = Off-site ash LF 5 = On-site surface impdt. 6 = Off-site surface impoundment 7 = On-site stockpiles 8 = Off-site stockpiles 9 = other 10 = 1+7 11 = 4+9
VII. 10	RECYCRU	Recycling or reuse	2	1 = Aggregate in asphalt 2 = LF cover material 3 = Concrete blocks 4 = Deicing material 5 = Metal reclamation 6 = Other 7 = N/A 8 = 1+2
VII. 11	RECYRE	% of ash recycled/reused	3	Actual %

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

SURVEY QUESTION NUMBER	VARIABLE NAME	VARIABLE LABEL	VARIABLE LENGTH	CODING
VII. 12	LSDISPOS	Where liquids/sludge disposed	2	1 = Wastewater treatment plant 2 = Sanitary sewer 3 = Landfill 4 = Other 5 = N/A
VII. 13	PHONE2	Disposal site phone number	10	Actual phone number
	YEARS	Years ash sent to disposal site	2	Actual # of years
	OWASTE	Other waste disposed of at site	1	0 = None 1 = Non-combustibles 2 = Solid waste 3 = Industrial solid waste 4 = N/A 5 = Municipal waste 6 = Demolition waste
	OVERALL	Overall disposal site dimensions	3	Actual acres
	ACELL	Active cell dimensions	3	Actual acres
	PLACE	Ash mixed with trash or segregated	1	1 = Mixed 2 = Segregated 3 = N/A

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

SURVEY QUESTION NUMBER	VARIABLE NAME	VARIABLE LABEL	VARIABLE LENGTH	CODING
	LINER	Type of landfill liner	1	0 = None 1 = Clay 2 = Synthetic 3 = Composite 4 = Yes, not specified 5 = 1+3
	LCS	Leachate collection systems	2	0 = None 1 = Piping/drainage to tank/area 2 = Double lined/material above liner 3 = Other 0 = None 1 = Berms 2 = Levees 3 = Graded slopes 4 = 1+2 5 = 1+3 6 = 2+3 7 = 1+2+3 8 = Yes, not specified
	ROROC	Run-on/run-off controls	2	1 = Topsoil 2 = Clay material 3 = Glacial till 4 = Area seeded 5 = Other 6 = N/A/unknown
	DFC	Daily and final cover	2	

CODING STRUCTURE FOR MUNICIPAL WASTE COMBUSTION ASH SURVEY

SURVEY QUESTION NUMBER	VARIABLE NAME	VARIABLE LABEL	VARIABLE LENGTH	CODING
	EMS	Environmental monitoring systems		0 = None 1 = Groundwater monitoring wells 2 = Air monitoring 3 = Both
	EXTP	Any future expansion plans	1	1 = Yes 2 = No

• - Variable not coded due to low response rate